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Hunterian Lectures
ON
LINKS IN A CHAIN OF RESEARCH ON SYPHILIS.

Delivered before the Royal College of Surgeons of England

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LECTURE I.

Delivered on March 6th, 1916.

MR. PRESIDENT AND GENTLEMEN,—Before dealing with the main theme of these lectures, it would be as well to glance over the advances made in the knowledge of syphilis since the eighteenth century, as by so doing it will be easy to show how we have arrived at our present state of knowledge.

HISTORY (1786–1916).

I propose to take as my first milestone the work done by John Hunter in the latter part of the eighteenth century. It will be remembered that about that time the burning question of the day was whether gonorrhœa and syphilis were forms or stages of one and the same disease, or whether they were two different diseases. To settle the question, Hunter inoculated himself with the discharge from a case of gonorrhœa and developed both gonorrhœa and syphilis, with the result that the unicity of the two diseases appeared to be established. Although many observers were still sceptical and really believed in the duality of the disease, it was not until about half a century later that Ricord finally proved to the world that the dualists were correct. Ricord, a Frenchman, was undoubtedly the first to give us a clear account of the clinical features of syphilis, and most of his work stands as good to-day as when he wrote it.

Our clinical knowledge of syphilis was greatly added to after Ricord's time by another Frenchman, Fournier, and by an Englishman, Jonathan Hutchinson. Both these men held the palm for increasing our knowledge of syphilis until it left us for Germany in the year 1905. From 1905 onwards, up to the present time, we have been served up with so-called epoch-making discoveries. In 1905 Schaudinn and Hoffmann discovered the spirochæta pallida, which is, even up to the present time, generally regarded as the cause of syphilis. In 1907 the Wassermann reaction saw daylight, and in 1909 we had Ehrlich's discovery of salvarsan.

Let us return to the year 1905, and let us see how the discovery of the spirochæta pallida was made. The opinion was held that the probable cause of syphilis was a protozoon; hence it was suggested to Schaudinn, who was one of the leading protozoologists of the day, that he should examine some syphilitic material for protozoa. Schaudinn, as he lived in Bonn, obtained his material from Hoffmann, who had charge of the Venereal Department of the University at that time. I think I am right in saying that the spirochæta pallida was found in the first material examined, and the discovery was confirmed by the subsequent examinations. The world was then told that the cause of syphilis had been discovered. Everyone hastened to repeat the work, and in a very short time the spirochæta pallida had been found in almost every known syphilitic lesion. Although one or two observers tried to ascertain what kind of an organism the spirochæta pallida was, most were perfectly content to regard it as an organism which had no other phase, in spite of the fact that no one had succeeded in actually witnessing division—surely a peculiar occurrence, considering that no more perfect methods of demonstrating an organism existed, and that no organism was more frequently searched for and studied.

I shall leave the spirochæta pallida for a moment, and turn to the Wassermann reaction. Pathologists, in the years just prior to 1907, had been paying considerable attention to the problems of immunity, with the result that various methods had been discovered for the detection of specific bacterial infections. One of the most important of these was Bordet and Gengou's complement-fixation test, by means of which an infection could be diagnosed by finding its antibody in the serum. In order to carry out the complement-fixation test it was necessary to have an extract of the bacteria, the antibody of which was to be sought. As the spirochæta pallida had, up to this time, resisted all attempts to be cultured, Wassermann made an extract of syphilitic fœtal liver, an organ which had been proved to be especially rich in specific spirochætæ, and he used this in place of an extract of the cultured organism.

The modified complement-fixation test was stated to be specific. Like the discovery of the spirochæta pallida, the Wassermann reaction very soon became general, and we all rushed to the conclusion that a positive reaction always meant that a patient had active syphilis, and therefore required treatment, and that a negative reaction often meant that the patient was cured, in spite of two glaring facts: (1) that an extract of non-spirochætal tissue would serve equally well as the antigen; and (2) that the rationale of the reaction was a complete enigma.

Two years later—i.e., in 1909—Ehrlich discovered salvarsan.

Outline of Inception and Results of Research.

As the rationale of chemotherapy is to form the main theme of my lectures, I will not, for the moment, go more closely into Ehrlich's discovery, except to mention one point, upon which hangs what I must deal with first. It was a recognised fact that, 24 hours after the first injection of salvarsan, no spirochætæ pallidæ could be found in the syphilitic lesions, yet it was necessary to repeat the injections of salvarsan several times, and to prescribe mercury afterwards. This paradox led me to doubt whether the statements made about the German discoveries were correct, and, looking at the whole subject, as I did then, with a very open mind, three pertinent questions confronted me, a solution to which I could not find with the knowledge as it then existed. The three questions were the following: 1. If the spirochæta pallida is the cause of syphilis, why do we never see it divide? 2. If all the spirochætæ are killed within 24 hours after the first injection of "606," why is it necessary to continue treatment? 3. If the spirochæta pallida cannot pass through the placenta, how can an apparently healthy woman bear an actively syphilitic child, since it is impossible to imagine that an organism as long as a spirochæta pallida should enter the ovum with a spermatozoon?

It then occurred to me that the spirochæta pallida was not the absolute cause of syphilis, but possibly only a phase in the life-history of a protozoon. Owing to the fact that the spirochæta pallida did not appear to multiply by division or to alter in any way at all, and owing to its close resemblance to male gametes of other protozoa, and even to the spermatozoon itself, it struck me that the organism might perhaps be the adult male, or, at any rate, an end-phase of a complicated protozoal life-history.

In 1911 I began to examine lymphatic glands from the region draining the site of the initial lesion, and I soon found some bodies which I thought might be parasitic in nature, as they had special staining properties, and could not be demonstrated in the control material. As a result of further investigation, with both live and fixed tissue, I was able to work out the life-cycle of what was evidently a coccidial protozoon. As a result of some chemical investigations, I found that the phases of the protozoon consisted of a protein, which had special properties. This, then, gave me a clue which resulted in my being able to explain the rationale or *modus operandi* of the Wassermann reaction. The Wassermann reaction turned out to be a physical reaction dependent upon certain properties which the protein particles of syphilitic sera naturally possessed.

Having found out what these properties were, it became clear how salvarsan worked. Further investigation into this subject soon unravelled the rationale of chemotherapy and opened the way along which future research might be expected to be most productive. One of the first drugs I prepared turned out to be better in many respects than any anti-syphilitic remedy which had previously been discovered, showing that each piece of work dovetailed into the other, the best proof of their correctness. I will attempt to traverse the ground again, and to show how each step follows on the other; therefore I will begin by mentioning a few words about the life-cycle of the organism of syphilis.

THE LIFE-CYCLE OF THE ORGANISM OF SYPHILIS (LEUCOCYTOZOON SYPHILIDIS).

The life-cycle commences with a spore or, as it is generally called, a sporozoite. The sporozoite then becomes intracellular. It chooses a connective-tissue cell or an endothelial cell as its host, and, when inside, it undergoes important changes, which can best be described under two headings.

1. The sporozoite steadily increases in size, and by a process of budding, gives rise to several bodies which later become differentiated into male and female elements (merozoites). When the merozoites are ripe, they escape from the cell, and are then called male and female gametocytes.

2. The sporozoite increases in size, but not to the dimensions met with in the previous case. Having reached a certain size, it divides into two, and again into four. These four masses, by a process of further subdivision, develop into a spore-cyst, and this spore-cyst gives rise to spores. This is doubtless the true asexual stage, and the two stages just described represent the schizogony.

Both the male and female gametocytes are motile, but not flagellated. The male consists of three nuclear bodies, while the female contains a nucleus at her upper end and one or two very actively motile blepharoplasts at her lower end. When the female has reached the size of a red blood corpuscle she loses her blepharoplasts and becomes stationary. Before fertilisation the nucleus of the female gamete moves from the upper pole, takes a central position, and fills up practically the whole cell.

The male gametocyte may develop intracellularly or extracellularly. If the former it enters a large mononuclear leucocyte, wherein the three nuclear bodies increase in size, develop into a coil, and from each nuclear body a number of spirochætæ arise, like the spokes of a wheel from its axle. The spirochætæ break loose, and each can then be recognised as a true spirochæta pallida. In the extracellular development each nuclear body divides and subdivides, so that a rosette-like appearance is formed. Several bodies may break away *en masse*, in the shape of a chain, which ultimately breaks up into distinct coccus-like forms, or discrete coccus-like forms may at first break away. Each coccus-like body contains two rods, which give it the appearance of a diplococcus, and these rods develop into thick and unevenly coiled spirochætæ which eventually become typical spirochætæ pallidæ. The immature spirochæta, which is first formed in this extracellular route, resembles the refringens type; therefore it is very probable that a spirochæta in two stages of its development is indistinguishable from the spirochæta refringens and the spirochæta pallida.

In fertilisation the spirochæta appears to enter the female nucleus, wherein it becomes lost; but in some cases it seems to become connected with the female nucleus by a skein. In both cases the nucleus, which contains both male and female elements, migrates again to the upper pole; such a cell is a zygote. In the nine instances in which I have witnessed fertilisation, only one spirochæta has been observed to enter the female, and it takes about an hour to become entirely lost to view. While entering the whole cell is in active motion, but once the spirochæta has entered the cell comes to a sudden standstill, and appears to become covered with a mantle. A few minutes after impregnation a polar body is expelled with considerable force from the cell, and again another after an interval of a minute or two. During the extrusion of the polar bodies the cell is very actively motile, but it becomes stationary immediately after the second has been ejected. The nucleus of the zygote divides and subdivides into sporoblasts; the sporoblasts may further divide and subdivide *in situ* to form sporozoites; or, a sporoblast may escape and form sporozoites immediately.

From the above description of the life-history of the organism of syphilis I think I am justified in assigning it to the order Sporozoa, and to the sub-class Telosporidia, since the spores are formed at the end of a cycle. The order is doubtless the Coccidiidea, and the species which most befits it is the leucocytozoon; hence a good name for the syphilitic parasite would be *Leucocytozoon syphilidis*. I cannot deal with all the theoretical arguments which have been brought forward against my discovery of the leucocytozoon syphilidis, as it is not in the scope of these lectures, and they have been fully dealt with in my book, "The Biology and Treatment of Venereal Diseases." Suffice it to say here that I have proved these contra-arguments to be false, by a study of the chemistry of the protozoon.

As this chemical study opened new paths of research to me, some of which seemed to lead towards the explanation of the rationale of the Wassermann reaction, I will here indicate what they are. I found that the phases of the leucocytozoon syphilidis consisted mainly of a lipoid-globulin, which proved itself to be more resistant to reagents than the lipoid-globulin of the host's cells—viz., the protoplasm of the plasma cells and of the nucleoli. Further, that its reducing action was also greater, especially in the case of the spirochætal phase, owing to its containing in its molecule a fatty acid not completely saturated. As a result, it was a simple matter to devise several differentiating methods of staining the organism.

STAINING.

I must mention now a few points on the staining properties of the leucocytozoon syphilidis.

The syphilitic organism will stain *in vivo* with borax methylene-blue, some phases with its methylene-violet, and other phases with its methylene-red moiety. Methylene-violet is positively charged, and it is a reduction-sensitive stain, while methylene-red is negatively charged, and it is not reduction-sensitive. Most living cells have a negative charge, for the reaction of the tissues always tends towards the alkaline side of neutrality, for the reason that there are always more hydroxyl (OH') than hydrogen ($H\cdot$) ions. Therefore, most living cells stain better with basic than with acid dyes. The spirochæta pallida, and the female gamete after fertilisation—i.e., the zygote—take the methylene-red stain, while the other phases take the methylene-violet, except the phases between the zygote and the spore, which stain metachromatically—that is, with both methylene-violet and methylene-red. When staining fixed tissue with pyronin and methyl-green, all the phases stain with pyronin and none with methyl-green. At first sight it might be thought that the syphilitic phases had no nuclei, but such is not the case, since the simple manœuvre of using acetic acid before staining enables the nuclei to stain deeply with methyl-green. Methyl-green is a reduction-sensitive stain, indeed, far more so than methylene-violet. Therefore, from what has already been said, it is clear that the phases of the leucocytozoon syphilidis have strong reducing properties which prevent them under ordinary circumstances from staining with methyl-green.

Turning attention to the plasma cells for a moment, *in vivo* they show practically no affinity for methylene-red; when fixed, the protoplasm and the nucleolus stain with pyronin, while the nucleus stains with methyl-green. Under ordinary circumstances pyronin will not stain nuclei, because it is an oxidation-sensitive dye. Therefore, staining is largely influenced by oxidation and reduction. Methyl-green is avid for active oxygen, and therefore will become adsorbed by any protein or lipoid-protein which contains it.

Since nuclei stain so well with methyl-green it is in the nuclei that active oxygen is to be found. Active oxygen converts pyronin into its carbinol or colourless base, hence pyronin cannot stain nuclei.

Reduction is dependent upon active hydrogen, and since active hydrogen converts methyl-green and methylene-violet into their leuco-bases it is at once explained, not only why the syphilitic phases do not stain with methyl-green, but it also shows that the lipoid-globulin of those phases is rich in active hydrogen.

Active hydrogen is electro-positive, and so is pyronin; therefore it is not owing to the presence of active hydrogen that the syphilitic lipoid-globulin is so markedly pyroninophile. The pyroninophile properties are probably due to the free hydroxyl groups in the form of peroxides, which are formed by the reducase system.

The evidence so far obtained is that the syphilitic organism consists of a remarkable lipoid-protein which is rich in active hydrogen, and that it also consists of nucleo-protein, which is rich in active oxygen.

OXIDASE-REDUCASE SYSTEM.

It is now necessary to inquire more fully into this oxidation-reduction process; in other words, we want to know how active oxygen and active hydrogen are formed.

The oxidation process, or better to call it "the oxidase system," has been well worked out by Bach and Chodat, who found that active oxygen was produced by the action of

a ferment, which they called a peroxidase, upon a peroxide. These two authors found, furthermore, that the peroxidase was a metal in the form of an hydroxide. The peroxide is simply another name for hydrogen peroxide. So far as active hydrogen was concerned, all we knew was that an extract of liver, which went by the name of Schardinger's enzyme, would, in the presence of an aldehyde, form active hydrogen; and although Heffter made the suggestion that Schardinger's enzyme was a sulphydryl group, neither he nor anyone else has shown how this sulphydryl group works or what takes the place of the aldehyde in the body. Owing to the invention of the word peroxidase Schardinger's enzyme came to be called perhydridase, and by further analogy this perhydridase is stated to form active hydrogen by its action upon a perhydride.

From my own investigations I am of the opinion that active oxygen is normally formed in the body by the action of ferric hydroxide protein upon five atoms of hydrogen and two peroxide groups, as in this equation:—

$$R.Fe(OH)_3 + 5H + 2H_2O_2 = R.Fe + 6H_2O + O''.$$

The peroxide atoms in the above equation are, in my opinion, formed along with active hydrogen by the action of di-sulphide protein upon two atoms of hydrogen and four hydroxyl groups, as in this equation:

$$R.S.S.R. + 2H + 4OH = R.S + R.SH + 2H_2O_2 + H\cdot$$

The parasitic lipoid-protein, as well as the lipoid-protein particles in the serum of the host, since the host's resisting substance is always as nearly as possible physico-chemically the same as that of the parasite, are now seen to possess a perfect oxidase-reducase system owing to absorbed ferric hydroxide and di-sulphide ions, which on the one hand form active oxygen (O'') and on the other active hydrogen ($H\cdot$). The great difference between the parasitic lipoid-protein and that of the host consists in the greater reducing action of the former, the significance of which will be seen later.

THE SIGNIFICANCE OF THE HYDROGEN AND HYDROXYL IONS.

The oxidase-reducase system, as has been seen from the equations just given, is dependent upon hydrogen and hydroxyl ions. Therefore it will be necessary now to say a few words upon the two most important catalysts known.

Serum, as is well known, is on the alkaline side of neutrality; hence it will always contain an excess of hydroxyl ions (OH'). Serum is peculiar, in that an equilibrium between the hydrogen and hydroxyl ions is maintained in it, an equilibrium which is usually known as the normal hydrogen-ion concentration. The hydrogen-ion concentration in serum is $0{\cdot}4 \times 10^{-7}$ and the corresponding hydroxyl-ion concentration is $7{\cdot}2 \times 10^{-7}$. Two questions now arise: 1. What is the purpose of this normal hydrogen-ion concentration? 2. How is this normal hydrogen-ion concentration maintained?

One of the most important rôles played by the hydrogen-ion concentration is the influence it exerts upon the solubility of insoluble electrolytes. As is well known, free acids are more insoluble than their alkaline salts and free bases are more insoluble than their chlorhydrates. Take, for instance, the base of salvarsan—namely, di-para-amino-arseno-benzene—or the base of intramine—namely, di-ortho-amino-thio-benzene; both are insoluble, or, in other words, cannot undergo electrolytic dissociation, yet when injected electrolytic dissociation must occur, as otherwise they would exert no therapeutic action. In the case of the di-para-amino-arseno-benzene, by inserting into its molecule two hydroxyl groups, electrical dissociation will occur in water, where there are free hydrogen and hydroxyl ions, and the dissociation will be greater if a salt of the base is used. Hence the reason for the insertion of the hydroxyl groups in salvarsan and the formation of the hydrochloride, two steps which really are not necessary, so far as the therapeutic action of the drug is concerned. Before an explanation as to how electrical dissociation of an insoluble body like intramine occurs *in corpore*, it will be as well to show how electrical dissociation of a simpler body occurs.

The solubility of benzoic acid in water, for instance, can be followed by the following equations taken from an article by Michaelis in the "Handbuch der Biochemie"

$$\frac{[\text{Acid anions}] \times [H\cdot]}{[\text{Non-dissociated acid}]} = K$$

In the above, K is the dissociation constant of the acid. The concentration of the non-dissociated acid is equal to the "partial solubility" of the acid, which can be designated as λ, and transformed into the following equation:—

$$[\text{Acid anions}] = \frac{K.\lambda}{[H\cdot]}$$

The "total solubility" of the acid can be given the capital letter Λ, and the equation will now run:—

$$\Lambda = \lambda + \frac{K.\lambda}{[H\cdot]} = \lambda.\frac{[H\cdot] + K}{[H\cdot]}$$

The "total solubility" Λ is therefore dependent upon the hydrogen-ion $[H\cdot]$ of the solution, while the "partial solubility," λ, is constant.

Applying this to the solubility of an amphoteric electrolyte, it will be seen that the "total solubility" equals the "partial solubility" plus the concentration of the anions on the one hand and the kations on the other, in a saturated solution of the ampholyte; — the equation being as follows:—

$$\Lambda = \lambda + [A\cdot] + [A']$$

λ is always constant, therefore, when Λ is a minimum, $[A\cdot] + [A']$ is a minimum, and this is the iso-electric point. Therefore, an amphoteric electrolyte has its minimum solubility at that hydrogen-ion concentration which corresponds to its iso-electric point. Every amphoteric electrolyte has two dissociation constants, an acid (K_a) and a base (K_b) which regulate the solubility.

From this it is clear that the lipoid-globulin particles in serum are kept in solution by the ions attached to them. It is also clear that the hydrogen-ion concentration must be constant, otherwise the lipoid-protein would begin to become precipitated, therefore, however big or however ionic the lipoid-protein molecules became, the acidic and the basic ions would always be so arranged that the hydrogen-ion concentration's optimum would be maintained. This is the reason why the hydrogen-ion concentration of a syphilitic serum is the same as that of a normal serum, although in the two cases the molecules themselves are so different.

From the above it will be seen how intramine gets into solution *in corpore*. In virtue of its amino groups it becomes adsorbed to the lipoid-globulin molecules, and since these molecules must maintain the hydrogen-ion concentration's optimum, various electrolytes will be discharged, a preponderance of acidic over basic or *vice versa*, according to the charge of the prevailing electrolyte in intramine. In the maintenance of this normal hydrogen-ion concentration intramine gets into "solution."

The greatest influence, then, of the hydrogen-ion concentration will be that which it exerts upon the precipitation of colloidal solutions—an influence which will be frequently shown and alluded to as we proceed.

Suspensoids and Emulsoids.

The one great distinction which all observers draw between a colloidal "solution" and a true solution, is the difficulty with which the former and the ease with which the latter dialyses. Another, and perhaps greater, distinction is, that a colloidal "solution" is really a suspension. A suspension is a microheterogeneous system—that is to say, a finely divided phase—the solubility of which in water is *nil*, but which is suspended in an aqueous phase. Colloids which fulfil the above definition are known as suspension colloids, or suspensoids, while proteins, which are in part soluble in water, are known as emulsion colloids, or emulsoids. Emulsoids come midway between suspensoids and crystalloids. There is no hard-and-fast line between these three physical states, since emulsoids may, in some cases, be solutions of substances of high molar weight.

There are three great differences between emulsoids and suspensoids, differences of density, viscosity, and surface tension. Surface tension is the important one from our point of view. Speaking generally, the surface tension of suspensoids is the same as that of water, while the surface tension of emulsoids is usually much smaller than that of water. It is owing to this difference that suspensoids are not so readily adsorbed as emulsoids. The smaller the surface tension of a saturated solution, the more this solution approaches a colloidal "solution." This property which, so to speak, stamps a colloidal "solution," consists in the greater tendency the solid phase has, first, to remain suspended in high dispersity in the saturated solution, and secondly, when it is precipitated, for the precipitate to be amorphous. Hence the explanation for the peculiar

properties witnessed in proteins. In the case of protein "solutions," which have a small surface tension, the ions attached to the solid particles play a very important rôle. As the solid particles are fully electrically charged, a fact which keeps them in suspension *in corpore*, the surface tension vanishes, and the particles remain still more firmly in suspension. If the particles become in any way de-ionised, the surface tension increases, and the small particles increase in size, with resulting agglutination and amorphous precipitation.

From these few remarks concerning surface tension it will be readily seen why agglutination, complement-fixation, and precipitation should be the pictures given by the immunity reactions *in vitro*. It will also be seen that all three are different phenomena of the same physical action and that, unless instantaneous death occurs, as is seen, for instance, in anaphylactic shock, none of these phenomena occurs *in vivo*.

The maintenance of this surface tension is dependent upon a certain hydrogen-ion concentration. Therefore the normal hydrogen-ion concentration serves the purpose of keeping the lipoid-globulin colloidal particles in "solution" in the serum. Now, as to how this normal hydrogen-ion concentration is maintained.

Maintenance of Normal Hydrogen-ion Concentration.

The lipoid-globulin particles form the internal, or, as it is sometimes called, the disperse phase, and the serum in which they are, forms the external phase or the dispersion medium, therefore the normal hydrogen ion-concentration will be maintained on the one hand by the internal phase and on the other by the external phase. Although the action of each will be discussed separately, the two actions are, of course, interdependent.

There are what may be called two systems which maintain the normal hydrogen-ion concentration in the external or continuous phase: (1) the phosphate system, (2) the bicarbonate system. The phosphate system is made up of an acid and a basic sodium phosphate, the former being the mono-sodium phosphate (NaH_2PO_4) and the latter the di-sodium phosphate (Na_2HPO_4). Like water, these two salts are continually undergoing electrolytic dissociation, as in the following equations:—

$$NaH_2PO_4 = Na^{\cdot} + H^{\cdot} + HPO_4''$$
$$Na_2HPO_4 = Na^{\cdot} + Na^{\cdot} + HPO_4''$$
$$H_2O \rightleftharpoons H^{\cdot} + OH'$$
$$H_2O + HPO_4'' = H_2PO_4 + OH.$$

The bicarbonate system is very similar, as the following equations show:—

$$NaHCO_3 = Na^{\cdot} + HCO_3'$$
$$H_2CO_3 = H^{\cdot} + HCO_3'$$
$$H_2O \rightleftharpoons H^{\cdot} + OH'$$
$$H_2O + HCO_3 = H_2CO_3 + OH'$$

In this way a balance is maintained between the hydrogen- and hydroxyl-ion concentration of the disperse medium. From the equations just given the number of hydrogen ions formed is the same as the number of hydroxyl ions, but as I have already said, there are more hydroxyl than hydrogen ions in the serum. How, then, is this excess formed? Cells have functions to perform, for the performance of which they must have active oxygen. After the oxygen has been used up it is discharged as carbon di-oxide. The presence of carbon di-oxide in the serum would increase the concentration of hydrogen bicarbonate (HCO_3'). This hydrogen bicarbonate would undergo electrical dissociation with water into hydrogen carbonate (H_2CO_3) and hydroxyl-ion (OH'), thus giving rise to an excess of hydroxyl ions in the serum.

The normal hydrogen-ion concentration of the internal phase is maintained by the oxidase-reducase system, which I have already described. As the ferric hydroxide protein and the di-sulphide protein form active oxygen on the one hand and active hydrogen on the other hand, with the free hydroxyl and hydrogen ions formed by the electrical dissociation of the phosphate and bicarbonate systems with water, it will be seen that the maintenance of the hydrogen-ion concentration of the external phase and that of the internal phase are interdependent.

From here I must now turn to the Wassermann and other immunity reactions.

IMMUNITY REACTIONS "IN VITRO": COMPLEMENT-FIXATION TEST, WASSERMANN REACTION.

No object is served by my going into the various theories of immunity, as even Ehrlich's side-chain theory, a theory evolved on the work done mainly by Bordet, a Frenchman, recent as it is, is no longer tenable. Suffice it to say here that resistance depends upon protective substances which circulate in the serum. These protective substances are lipoid-globulin particles which emanate mainly from lymphocytes, and which exist in the serum as emulsoid particles.

These emulsoid particles form what is usually called the antibody. The term antigen is given to the foreign body (bacterium, red blood corpuscle, &c.) which stimulates the formation of the antibody. The union between the antibody and the antigen depends upon a third substance, which goes by the name of complement. Antigen consists of lipoid-globulin particles, and the antibody so constitutes itself that it possesses a stereo-chemical molecular configuration homologous to that of the antigen. Herein lies the explanation of specificity. Now specificity, contrary to general belief, is practically never absolute. For instance, the Wassermann reaction may be positive in all protozoal diseases; further, salvarsan produces changes in the plasma cells, as I have described, in syphilis, in other protozoal diseases, and sometimes in cases of tuberculosis, although to a much less degree. An emulsion of the spores from a culture of sporotrichum beurmanni can be agglutinated, not only by the serum from a case of sporotrichosis but also by the serum from other diseases caused by fungi—for instance, actinomycosis.

At first sight, Abderhalden's test for pregnancy appears to be specific, but syphilitic sera will give positive ninhydrin reactions with placental extract. It is interesting to note in this connexion, clinically, not only is the course of syphilis considerably modified in a woman who is pregnant, but women in general, at any rate, up to the time of the menopause, are not so severely affected by syphilis as men are.

The most rational explanation of these phenomena, to my mind, will be found in likening the arrangement of the amino groups in the lipoid-globulin molecule to the bricks in a house. The house, at first sight, is always the same, but the arrangement of the bricks with which it is built varies, making each house look slightly different when thoroughly examined. Specificity is caused by the variation in the arrangement of the bricks, which are the amino groups in the lipoid-globulin molecule. The range of specificity is unlimited, therefore the variation in the bricks is not so much the alteration of one brick as a change in the combination of several.

This being the case, it is possible for different infections to produce partly similar combinations of the groups which go to make up the lipoid-globulin molecules. The combination may be the same up to a point, and then the last few bricks may make all the difference. From this it may be inferred that some of the groups which go to make the syphilitic lipoid-globulin are also the same as some of those which go to make up the lipoid-globulin of the sera of women. In other words, there is a common combination of the groups somewhere in the molecules which constitute the lipoid-globulin of syphilitic sera on the one hand and the sera of women up to the menopause on the other hand, and that the combination becomes the closer in women who are pregnant.

Complement.

Having briefly referred to the nature of antigen and antibody, it now remains to discuss the nature of complement. The first to throw any real light upon the nature of complement was Ferrata, who succeeded by dialysis in dividing complement into two parts. Sachs and Altmann succeeded in separating these two parts, by first acidifying with weak hydrochloric acid and then neutralising the same. Liefmann and Cohn gained the same object by precipitation with carbon dioxide. These two parts received the names of middle piece and end piece, and were so christened by Brand. Brand found that the middle piece was attached to the globulin fraction of the serum, and that it was the middle piece which was fixed by the amboceptor and by the red blood corpuscles in the hæmolytic experiments. The end piece remained free until the middle piece was firmly fixed, and not till then did it become bound itself.

Michaelis and Skwirsky found that red blood corpuscles which had adsorbed amboceptor, and had been treated with mono- and di-sodium-phosphate instead of with complement, only fixed the middle piece of complement when it was added, leaving the end piece free to be collected if required.

Discussion then arose as to the nature of these two pieces. Sachs and Bolkowska pointed out that both pieces were thermolabile. Then Sachs and Teruuchi showed that, if guinea-pig's serum was inactivated by distilled water, further addition of sodium chloride failed to restore its action. Adding to such an inactivated serum some end piece often had the effect of restoring the complement action, adding some middle piece seldom did, while adding both always did. Liefmann and Cohn, as a result of several experiments, found that the quantity of middle piece fixed was infinitesimal, an observation which led them to suggest that complement was a ferment. Fränkel, using carbon dioxide to separate the middle and end pieces of complement, found that the end piece, or, as he called it, the albumin portion, increased the action of both split and intact complement. The middle piece, or, as the same observer called it, the globulin portion, prevented the action of both split and intact complement.

From the work of the observers mentioned, and of others who have confirmed them, it may be noted that the action of complement is that of a ferment, and that complement can be divided into two parts, both of which when added will always restore the action.

My own investigations into the nature of complement led me to believe that it was part and parcel of the antibody, that it was a ferment or catalyst, since its action depended upon concentration and not upon the absolute quantity used, and that it was probably linked on to the lipoid-globulin molecules by means of the ions. Further investigations showed me, not only that complement was an expression of the oxidase system, as I had previously thought, but of the reducase system also. In other words, I found that complement represented the balance between the hydroxyl and hydrogen-ion concentration of both the internal and the external phases.

Light is now thrown on the so called middle and end piece of complement. The middle piece is the oxidase-reducase system of the internal phase, while the end piece represents the hydrogen and hydroxyl ions of the external medium. If complement is divided into its two pieces the end piece alone may act feebly as complement, while the middle piece may act in the opposite direction, but when both pieces are mixed full complement action is again restored, a fact which clearly proves the statement I made earlier—namely, that the normal hydrogen-ion concentration of both the internal phase and of the external phase were interdependent.

From the remarks I have already made concerning the chemico-physical properties of emulsoids, added to which is the knowledge gained as to the nature of antibody, antigen, and complement, it will be clear as to what happens when these three substances meet, but the phenomena witnessed *in vitro* will not be analogous to those which occur *in vivo*, as it is only *in vitro* that one of them—namely, complement—is completely destroyed (excepting in the condition known as anaphylactic shock).

Experiments with Hæmolytic System.

Before discussing the phenomenon of adsorption in a case in which the antibody is specific, I will relate a few experiments I have made with the hæmolytic system. It was generally thought that for hæmolysis to occur in the presence of complement and of an antibody the antibody must be specific. Such is not the case, because hæmolysis will occur if colloidal aluminium hydroxide takes the place of the antibody. Colloidal aluminium hydroxide becomes adsorbed by the red blood corpuscles, but no change in surface-tension occurs, and therefore no hæmolysis, until complement is added. When this physical change takes place complement is destroyed. If a little glycine, albumin, gelatin, or agar is added to the aluminium hydroxide beforehand, even in the presence of complement, no hæmolysis occurs.

Aluminium hydroxide is a suspensoid, and therefore is very sensitive to electrolytes. In the presence of complement it will very quickly upset the normal hydrogen-ion concentration, with the result that the lipoid-protein particles will tend to reach their iso-electric point and will tend to become more suspensoid, phenomena which cause an alteration of surface-tension—hence hæmolysis.

Aluminium hydroxide glycine is an emulsoid, and therefore is not sensitive to electrolytes. Although aluminium hydroxide glycine is adsorbed by the red blood corpuscles, both being perfect emulsoid colloids, they are kept in "solution" by the normal hydrogen-ion concentration (complement), with the result that there is no change in surface-tension; hence hæmolysis does not occur.

In the case of a specific antibody, hæmolysis will occur in spite of the fact that the specific antibody is an emulsoid. If the antibody is very fresh and active, hæmolysis may not result; this is also often the case in other immunity reactions. Fresh specific serum may fail to give the agglutination and precipitation tests, and an active syphilitic serum may give a negative Wassermann reaction, showing clearly not only that immunity reactions *in vitro* are not analogous to what occurs *in vivo*, but also that death of the organism may take place without there being any apparent microscopic change in its form. How, then, does a specific antibody differ from aluminium hydroxide glycine? Specificity lies in the amino groups of the lipoid-globulin molecules, not in the amino groups as such, but only so far as they are combined with the carboxyl groups to constitute the lipoid-globulin molecule. Permeability is regulated by the carboxyl groups, but again only in virtue of their combination with the amino groups.

The phenomenon of adsorption is especially marked with emulsoid colloids, in view of the amino groups. Hence, when a specific antibody meets its specific antigen *in vitro*, adsorption takes place, and the adsorbed lipoid-globulin molecules, owing to a certain de-ionisation which occurs as the result of the adsorption, destroy the complement and become precipitated, or, strictly speaking, they become more suspensoid, since they are brought nearer to their iso-electric point, with the result that a change is brought about in the surface tension. Any interference with the amino groups at once destroys the specificity.

Wassermann Reaction.

So far as the rationale of the Wassermann reaction is concerned, the only data required are: (1) the active principle of the antigen; (2) why syphilitic sera should, in preference to other sera, adsorb the antigen. Various investigations showed that the active principle in the antigen was nitrogen, in the form of an amino-acid, but that another factor played a rôle, since the conversion of the amino groups into methylene imino groups, which may be done by formalin, as shown in this equation—

$$H.COH + R.NH_2 = R.N.CH_2 + H_2O,$$

increased its antigenic properties.

The methylene imino groups are larger than the amino groups and are more suspensoid in character; therefore the addition of formalin increases the size of the colloidal particle. Adding cholesterol to the antigen increases its adsorptive capacity. The syphilitic antibody (lipoid-globulin particles) in the Wassermann reaction, since it is a non-specific reaction, is best designated as the reacting substance, or "reagin" for short. Syphilitic lipoid-globulin is peculiar, in that its particles are larger than those from most other diseases; indeed, protozoal diseases can be roughly separated from bacterial diseases by the difference in the size of the lipoid-globulin particles, and the increased adsorptive power of the molecules of the former over those of the latter. These two observations are doubtless the most important in the whole of my research work, and they are two which can be easily proved. Ultramicroscopic examination proves them both at once, but the most conclusive proofs are, that a syphilitic serum contains more protein nitrogen, more adsorbed amino nitrogen, and more adsorbed ions than normal serum.

From what has already been stated, it becomes now perfectly clear why complement should be destroyed when a big emulsoid particle like syphilitic lipoid-globulin adsorbs an emulsion colloid like antigen, which is more suspensoid than a specific antigen. As the lipoid-globulin molecule is bigger in late than in early cases of syphilis, it will follow that the Wassermann reaction will be more marked in that stage in which there are the fewest number of organisms. Since, moreover, an uncombined carboxyl group may prevent a syphilitic serum from giving a positive reaction, in virtue

of the effect it has upon surface tension, and owing to the fact that once the lymphocytes have had to form such lipoid-globulin particles they may go on doing so although there may be no more organisms to kill, it necessarily follows that a negative Wassermann reaction is always valueless, and that a positive Wassermann reaction does not invariably indicate that the patient has active syphilis, or that he requires further treatment.

Normal sera will always give a positive Wassermann reaction if the size of the lipoid-globulin molecule is made sufficiently big—or, better to say, rendered less emulsoid—than it is under normal circumstances. Heat will do it; so will alternate freezing and thawing; so will a plus or minus change in the atmospheric pressure; and so will the addition of a non-colloidal body like barium sulphate.

Nature of Immunity Reactions.

Therefore, the Wassermann reaction is a purely physical reaction, while the specific complement-fixation test is a chemico-physical reaction, as it depends upon an homology which exists between the amino groups of the antigen and the antibody. Neither the specific nor the non-specific complement-fixation test shows exactly how an organism is attacked by the resisting substance in the body. The agglutination test throws no further light on this point, nor does the precipitation test, so let me close this part of the subject with the remarks, before discussing the main point in question, that an alexin, an opsonin, a bacterio-tropin, an amboceptor, an agglutinin, a precipitin are all the same substance, and the part exhibited by each is only an exhibition of different physico-chemical phenomena possessed by that one substance, which is a lipoid-globulin, and is best called the resisting substance.

Finally, no proteolytic ferment comes into any of the reactions, and Abderhalden's test—which, by the way, is not specific, since a syphilitic serum will give a positive reaction with any organic extract, for the same reason as it adsorbs the antigen in the Wassermann reaction—is merely a chemico-physical reaction, which is carried a step further than the other immunity reactions. *In vivo* no immediate change results from the adsorption of antigen and antibody. *In vitro* one change is agglutination, a further change is precipitation, a further change still is hydrolysis. If a dialyser be used the precipitated lipoid-globulin which has resulted from the adsorption with its antigen, owing to its becoming more crystalloid, will allow some of the amino groups to pass through the fish bladder and give the ninhydrin reaction.

An outstanding feature in my work on the chemico-physics of immunity is that, in chronic infections, the changes produced in the lipoid-globulin particles are often in an increasing ratio, in a ratio which is independent of the number of organisms to be killed. In other words, I have found that if the stimulation of the lymphocytes—and, for that matter, of other cells in their own case—to form protective substances is sufficiently prolonged the molecules of the cells themselves will increase in size and become more like suspensoids, in which condition they will act as foreign bodies. I have gone fully into this subject in Part II. of my book, "The Biology and Treatment of Venereal Diseases," as I feel sure it is research on these lines which will unravel the mysteries of malignant disease.

THE MODE OF ACTION OF THE RESISTING SUBSTANCE "IN CORPORE."

A discussion on this subject at once introduces the problems of natural and artificial immunity, about which a few words must be said. There are many examples of natural immunity: for instance, cold-blooded animals are immune to infection by organisms which produce diseases in warm-blooded animals, and *vice versa*. In any case, bacterial infections are more common in warm-blooded than in cold-blooded animals.

Diseases of birds, such as psittacosis, &c., cannot be conveyed to mammals. Furthermore, carnivorous animals are more or less immune to those bacteria which cause diseases in herbivorous animals, or in man, who subsists on a mixed diet. Man appears to be absolutely immune to rinderpest, and all but the higher mammals to such diseases as scarlet fever and measles. Natural immunity, such as above described, is really only an apparent immunity, and is not analogous to the immunity produced by a bygone infection.

The food on which the animal lives plays a rôle; also its temperature, since, if the temperature of cold-blooded animals be raised, they can develop tetanus, a disease to which they are, under ordinary circumstances, immune. There is even a difference in race resistance—a difference which, in some cases, is probably due to the food upon which the animal lives. For example, Yorkshire pigs are more resistant than other breeds to a special form of erysipelas from which pigs suffer. The older races of cattle are more disposed to tuberculosis than the new races or species. Again, different breeds of mice react differently to anthrax, and to an infection caused by the micrococcus tetragenus.

So far as syphilis is concerned, it is certain that all races, irrespective of climate and food, are equally prone to be infected with it. The reason why Livingstone thought that pure-born Africans were immune to syphilis was simply because the races to which he referred had never been in contact with white people, and therefore had never run the risk of catching the disease. Before the white man settled in Uganda syphilis was unknown there; now it is well-nigh a plague amongst the natives. Monkeys can be easily infected with syphilis, but it is doubtful whether the lower mammals can. Because rabbits develop chancres and regional adenitis after subcutaneous injections of spirochætal material, and general lesions, if the spirochætal emulsion be injected intravenously, it does not follow that the rabbits have developed syphilis.

Probably, if a sufficient quantity of rinderpest infection were injected into a human being, he could be made to develop symptoms simulating the real disease. There is no doubt that infections can be produced in man or in animals which, under prevailing conditions, have a natural immunity against such; therefore natural immunity is probably due to certain physical conditions which naturally exist, and is not analogous to the immunity which follows an infection, an immunity probably due to the artificial production in the serum of protein colloidal particles which possess the same stereo-chemical molecular configuration as the protein molecules of the parasites.

Broadly speaking, if an individual has had a disease he is less likely to contract the same disease again. The period at which the first attack is cured—that is to say, whether soon or late after its onset—has an influence upon the degree of the immunity acquired. The severity of the attack also has an influence, and so has the position in the body where the organisms are first implanted. An acquired immunity is not absolute, since the patient can usually be infected, provided a sufficient quantity of the infective material gets into his system. The main difference between acquired and natural immunity is that in the former the immunity is specific, and in the latter it is not.

The points brought out from the few remarks made show that immunity depends upon a certain physical state of the host; upon the position where the organisms are implanted; upon the number of organisms implanted; and upon whether the molecular configuration of the lipoid-globulin particles in the serum of the host is homologous to that of the lipoid-globulin molecules of the parasite.

Primary Struggle and Turning of the Tide.

When a man runs the risk of becoming infected with syphilis there must always be, first of all, a struggle between the cells of that man and the spores of the leucocytozoon. If the former win, then, of course, there is no infection. Assuming that the latter win, the spores having gained a firm foothold, will develop at their host's expense and produce a lesion, which we call a chancre. A further development of these spores will lead to a generalisation of them in the body of the host, with a result that lesions will occur all over the body. Instead of the development going further still the tide turns in favour of the host, and the number of the parasites gradually becomes lessened, with the result that the lesions disappear. The turning of the tide is due to the fact that the host's lymphocytes have been able to manufacture lipoid-globulin particles, the molecular configuration of which is homologous to that of the lipoid-globulin molecules of the parasite.

Two questions arise now: (1) What is the nature of the primary struggle? (2) What is the *modus operandi* of the turning of the tide?

In the remarks I have made already it will be remembered that there are only two factors which come into play in the

adsorption between antigen and antibody: (1) hydrogen-ion concentration (oxidase-reducase system); (2) specific amino groups. In the primary struggle the second factor cannot possibly play a rôle, since it takes some time for the amino groups in the lipoid-globulin molecules to be arranged in a specific manner. Moreover, the primary struggle is a local affair, a struggle between spore and cell, while the turning of the tide is a general affair—a struggle between the lipoid-globulin particles of the serum generally, of the plasma cells locally, and those of the parasites.

When a syphilitic spore enters the human body, in order to develop it must enter a connective-tissue cell or an endothelial cell. To enter a cell it must alter the surface-tension of that part of the cell where it is going to enter, and this will mean a local disturbance of the normal hydrogen-ion concentration. It is absolutely certain that all cells require and use oxygen, and probably certain that all cells (animal) in exchange for oxygen exhale carbon dioxide. Should a spore be able to take some of the oxygen required by the cell it hopes to enter, the normal ratio between the oxygen and the carbon dioxide of that cell will cease to exist, with the result that the normal hydrogen-ion concentration or the oxidase-reducase system will be locally deranged temporarily, with the result that the spore wins, since the local surface-tension of the cell will be such that the spore is practically drawn into it.

How this temporary derangement of the oxidase-reducase system can be directly prevented is not at present clear, but from analogy to experiments I have undertaken in another direction (anaphylaxis) the derangement can be prevented indirectly by increasing the stability of the permeability which can be done by intravenous injections of calcium chloride.

The *modus operandi* of the turning of the tide is probably as follows: Both the lipoid-globulin particles of the syphilitic phases and of the serum have an oxidase-reducase system. In the case of the former, the active oxygen is used by the nucleus for propagation purposes. In the case of the latter, there being no nucleus, the active oxygen will be used for that purpose for which the particles exist—namely, for the purpose of adsorption. Since the amino groups have the same arrangement in the two kinds of lipoid-globulin, the necessaries for the physical action of adsorption will be at their best As the active oxygen in the host's lipoid-globulin will only be required for this physical action, it will follow that the host's lipoid-globulin has an advantage over that of the parasite, with the result that the changes which the spore, in the primary struggle, caused the cell it was attacking to undergo, will now be visited upon the parasites themselves.

If these views are correct, we should be able to forestall the turning of the tide and to accelerate it by increasing the amount of active oxygen in the lipoid-globulin particles in the serum of the host. This can be done (1) directly, by the administration of strongly adsorbed metallic compounds, which act as peroxidases and produce active oxygen; (2) indirectly, by the administration of a strongly adsorbed non-metallic compound, which acts as a disulphide and produces peroxide and active hydrogen.

This now brings me to discuss the rationale of chemotherapy in syphilis.

DOCTORS AND NOTIFICATION FEES.—At a meeting of the Executive Committee of the National Medical Union, held at 346, Strand, on May 4th, the following resolution was passed:—

That the Executive Committee of the National Medical Union express their strong disapproval of the action of the Local Government Board in attempting to effect any reduction in the notification fees. They urge that all local non-panel bodies should pass strong resolutions on this matter and forward them direct to their local Members of Parliament, and that each secretary be advised to circulate a petition among the local profession and forward these petitions when complete to the secretary of the National Medical Union, 346, Strand. Such resolutions and petitions to be then referred to the Parliamentary Committee of the Union, with the object of taking such further action as may be necessary to place the matter before both Houses of Parliament.

THE LATE DR. GEORGE EDWARD LANYON, J.P.—Dr. George Lanyon, medical officer of health of the Port of Falmouth, who died suddenly at his residence in Falmouth on April 17th, in his fiftieth year, was for 20 years in partnership with Dr. W. Banks, of Falmouth. Later he practised in the town single-handed and had an extensive connexion. Besides being medical officer of health for the Port of Falmouth, he had recently been appointed a magistrate for the town, where he was highly respected. He leaves a widow and five young children.

MALIGNANT DISEASE OF THE NOSE OR ACCESSORY SINUSES.

ADVANTAGES OF OPERATION THROUGH THE FACE (MOURE'S OPERATION OR LATERAL RHINOTOMY); RECORD OF TWO CASES WITH NO RECURRENCE AFTER 5½ AND 3½ YEARS.

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Introductory.

THE recent progress of rhino-laryngology has been rapid. The records of much of it—such as endoscopy of the air and food passages, the removal of foreign bodies, and the examination and treatment of diseases of the œsophagus—have spread beyond our special journals and societies and have become common knowledge through the articles in the weekly medical press. But much of the advance of specialism is still unknown to the medical public, and this seems a pity when a good deal of it might be done by the general surgeon who is willing to acquire some of the technique of rhino-laryngology. Those who have not the taste or the opportunity for gaining dexterity in these modern methods are doubtless glad to hear of the advances which have been made; for just as the general surgeon has, in certain directions, carried research and treatment beyond the line where physicians were able to take it, so the specialist has been able to carry further perfection into the work of the general surgeon.

Historical.

In this article I propose to refer to some improvement in the surgical treatment of malignant disease of the nose and its accessory sinuses. Before the days of rhinology patients would rarely think of consulting anyone for such complaints as nasal obstruction, catarrh, or epistaxis. Hence the sufferer from cancer of the nose seldom sought advice until he presented himself to a general surgeon with some external manifestation of his dread disease. By the time it had reached that stage it was perforce far advanced, and the general surgeon had no alternative but to hazard some extensive and disfiguring operation from the outside of the face. This generally took the form of excision of the upper jaw, which was done for disease within the antrum itself, or in order to traverse that cavity so as to get at the ethmoidal or sphenoidal cavities. Sometimes, when the growth appeared to be limited to the nasal cavities, it was approached either by turning the whole outer nose up on to the forehead, or by the operation of Ollier in which the nose is reflected downwards from its root. It is common knowledge that in all these operations one certain consequence was marked disfigurement, and rarely were there any enduring benefits. The operation of Rouge (sublabial rhinotomy) was a decided step in advance. It avoids all external disfigurement, gives good access to growths in the anterior part of the nasal chambers, and is neither difficult nor dangerous.

With the birth of rhinology cases of cancer of the nose came under observation sooner, and some improvement ensued from earlier diagnosis. Operative measures carried on through the nostrils were certainly not mutilating, though it was only occasionally that they could claim lasting results. This is readily realised when we recollect how vascular are these growths, how difficult it is in the narrow, bony cavity of the nose to manœuvre round them, and how rapidly fungation takes place in a cancerous growth when it is only partly excised and is left exposed to the air. The route of approach *via* the nostril to these growths is difficult and oblique when they originate, as so many do, in the ethmoidal region and the antro-nasal wall. Now, it is precisely for malignant tumours originating in this region, as well as for those starting in the roof of the nose, in the antrum, or in the sphenoid, that I would particularly recommend the following operation.

Lateral Rhinotomy or Moure's Operation.

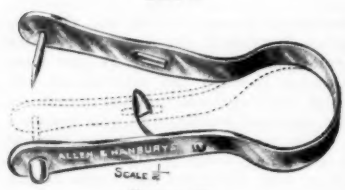
This operation was recommended as long ago as 1853 by Michaux, but for my first knowledge of it I am indebted to Moure, of Bordeaux.[1]

[1] Revue Hebd. de Laryngol., tome xxii., 1902, Oct. 4th, p. 401.

Preparation.—The interior of the nose is prepared 30 to 60 minutes before operation by coating the mucous surface with small pieces of one-inch ribbon gauze, saturated with equal parts of adrenalin and 5 per cent. solution of cocaine. These are tucked round the growth on the affected side, but it is well to "paper" the septum and even the nasal cavity on the healthy side, as this helps in checking hæmorrhage and certainly aids in diminishing shock.

When the patient has been placed under chloroform, two tethered sponges are introduced into the postnasal space. Each of these is made of honeycomb sponge, compressed to about the size of a walnut, attached to a piece of tape, introduced through the mouth into the nasopharynx, and tucked in so as to fit the posterior choana snugly. A clip is passed through the tongue, which is drawn forward, so as to allow of the administration of chloroform through the mouth. (Fig. 1.) If the operation is being performed for a growth which projects backwards through the choana or originates in the roof of the nasopharynx, or if the surgeon wishes to be able to introduce his left forefinger through the mouth into the postnasal space to steady the growth from behind, then it may be preferable to perform a preliminary laryngotomy and plug the entrance to the larynx with a tethered sponge, while the anæsthesia is continued through the laryngotomy tube. In one or other of these ways the inconvenience and dread of hæmorrhage is avoided, the anæsthesia can be quite smooth and free from anxiety, and the surgeon can operate thoroughly and comfortably.

FIG. 1.



Tongue clip

Operation.—Two incisions are started on the affected side, below the inner extremity of the eyebrow and halfway between the inner canthus of the eye and the centre of the root of the nose. (Fig. 2.) From this point one incision curves outwards below the lower eyelid to the prominence of the malar bone, and the other descends along the junction of the nose and cheek to the nasal orifice. If the growth has approached the nostril or is thought to be attached to the floor of the nose, it is well to carry the incision right into the vestibule, so as to detach the lobe of the nostril on that side, as in Fig. 2. But if the growth is in the higher or deeper parts of the nose there is no necessity to carry this descending incision further than the furrow behind the ala naris. (Cf. Fig. 10.)

FIG. 2.

Moure's operation. Skin incisions.

Both these incisions should carefully follow the natural creases on the face, the upper one curving along the junction of the lower eyelid with the face, and the vertical one lying in the wrinkle which is seen in many elderly faces along the side of the nose.

FIG. 3.

Moure's operation. Skin flaps have been retracted and the dotted lines show where the bones should be chiselled through.

These incisions are carried down to the bone and, with suitable periosteum detachers and raspatories, a triangular flap of skin and soft tissues is turned downwards and outwards. (Fig. 3.) The pyriform opening of the nose should be defined, as well as the margin of the orbit, the ascending process of the superior maxilla, and its junction with the frontal and nasal bone. This latter bone is exposed right up to its junction with its fellow by reflecting the flap of skin, soft parts, and periosteum on the nasal side of the field of operation. With chisel and hammer the bone is now divided along three lines: (*a*) the first divides the nasal bone from its fellow, just external to the site of the nasal septum; (*b*) the second passes outwards from the upper part of this division into the orbit and follows the line of junction of the frontal bone with the nasal and maxillary; and (*c*) the third passes from the lower and outer corner of the pyriform opening upwards and outwards into the orbit. In this last cut it is well to try and avoid the infra-orbital nerve in its canal, but this cannot always be respected. The piece of bone included in these lines is now seized with lion forceps and twisted out. Immediately below it we come directly on the ethmoid region, the antro-nasal partition, and the upper part of the maxillary sinus. (Fig. 4.) The lacrymal canal should be defined and carefully retracted under the lacrymal bone, so as to avoid the risk of having afterwards a lacrymal fistula. The ethmoid can now be dealt with directly. On plucking it away with some instrument like Luc's forceps (Fig. 5) we are able to see into the maxillary sinus from above, like looking into an egg-cup. This same clearance of the ethmoid brings the front wall and orifice of the sphenoidal sinus so well into the field that it is now hardly 1 inch distant from the surface, instead of the $2\frac{1}{2}$ to $3\frac{1}{4}$ inches which is the average distance from the anterior nares. This dissection also exposes the roof of the nose. Diseased growth is attacked with Luc's forceps, conchotomes, sharp spoons, or ring knives, and can readily be followed back into the nasopharynx and sphenoid, outwards into the orbit, and downwards right on to the floor of the nose and the maxillary sinus. If required, the whole of the orbital, nasal, and facial walls of the latter cavity can be

removed with bone forceps. If the growth is attacked boldly and cleared away quickly I have not found the hæmorrhage alarming. It can be controlled by pressure and packing with 2-inch ribbon gauze, moistened with adrenalin or 5-volume peroxide of hydrogen. Thanks to the two postnasal sponges, there is no trouble with blood descending into the air passages.

When the operation is completed and the bleeding arrested the skin incisions are carefully brought together with silkworm gut or horsehair sutures. Dressings on the face are not required; the wound glazes over with its own serum and heals up by first intention like a shaving cut. It may be protected with a pad of dry gauze until the patient recovers consciousness. It is also well to dispense with any dressing or plugging inside the nose, and to leave the cavity quite alone for four or five days. If oozing of blood should persist at the end of the operation, a piece of 2-inch ribbon gauze may be packed on to the spot and led out into the nostril, through which it is removed within 24 hours and not replaced. The postnasal plugs are, of course, removed before the patient leaves the table.

Progress.—The wound on the face heals up in a few days, and the patient may be about within a week (see Fig. 6). There will be some blood-stained discharge from the nostril for two or three weeks. The patient should avoid blowing the nostril carelessly during this time, so he must be instructed to suck the discharge backwards into his throat, while he is also relieved with nose lotions or sprays of some warm alkaline lotion (5 grains each of borax, soda, salt, and sugar to 4 oz. of warm water). If, when healing is completed at the end of from three to six weeks, there should be any crusting in the nose, this *toilette du nez* may have to be kept up indefinitely, but it is very remarkable that these cases seldom complain of the symptoms of atrophic rhinitis, although most of the turbinal tissue may have been removed. In this respect these cases differ very markedly from those in which the erectile tissue of the nose has been destroyed by syphilis or some pyogenic process.

FIG. 4.

Moure's operation. Exposure of the nasal and maxillary cavities through the side of the nose.

Results.—Externally the scar within a few months is so slight as to be almost invisible. (Figs. 6 and 9.) In some of my cases it can hardly be discerned, even when carefully searched for. There is certainly no disfigurement and no interference with the muscles of the face. A few patients report a little epiphora in windy weather, and some of them draw attention to the formication or numbness of the upper lip and cheek on the affected side. But I have met with no neuralgia or similar trouble, even when the bone with the infra-orbital canal in it has been removed.

Internally there is a free thoroughfare through the nasal chamber on the diseased side. This secretes sufficient mucus for lubrication, and yet there is no crusting. Loss of smell is never complained of if the septum has been respected. In successful cases the enlarged nasal cavity presents a perfectly healthy surface, and in all its anfractuosities it is now easy to keep a watchful eye for any appearances of recurrence.

FIG. 5.

Luc's nasal forceps.

Complementary Operations.

My present purpose is only to call attention to this particular operation, but, of course, it can be extended to meet the variable conditions met with, or combined with other operative steps. Thus, for instance, if it is found that the disease has deeply invaded the orbit this cavity can be cleared out through the same incision, preserving the lower eyelid, while, if necessary, sacrificing the eye. The nasal septum can be removed if the growth has attacked it. The antrum might be further dealt with by an incision through the canine fossa, although I have always found that the access to the sinus obtained by a Moure's operation could not be improved upon. This may also be combined with what is known as Denker's operation. If the floor of the nose is found to be invaded the addition of a Rouge's operation can be made.

Ultimate Results.

In all cases there is no mutilation or disfigurement. Patients will readily consent to the operation. They are left with an intact roof to the mouth and require no troublesome obturator, as in the old operation of excision of the upper jaw. It is much easier after a Moure operation to keep a direct look-out in the nose and its accessory cavities for any suspicion of recurrence. Recurrences are more easily dealt with, either through the nasal orifice or by repeating the lateral rhinotomy, and patients are less likely to object to this than to a further facial disfigurement.

Comparison.

When the upper jaw is removed for cancer of the maxillary sinus, the antro-nasal wall, the ethmoid, the roof of the nose or the sphenoidal body, it is, in the words of Macbeth, a "most bloody piece of work." It is chiefly the front maxillary wall and alveolus which are then removed, and this brings the surgeon but little nearer the origin of the growth, for which he has to grope in the dark depths of a bleeding cavity, where hæmorrhage is controlled with difficulty. If he can arrive at the ethmoid region or posterior part of the nasal chamber, it is difficult for him to do more than scrape away portions of the growth, and it is not therefore surprising that recurrence is almost the invariable rule.[2] Recovery is tedious and distressing, and, in any case, the patient is disfigured, and speech and deglutition are rendered uncomfortable. The treatment of any recurrence is almost impossible.

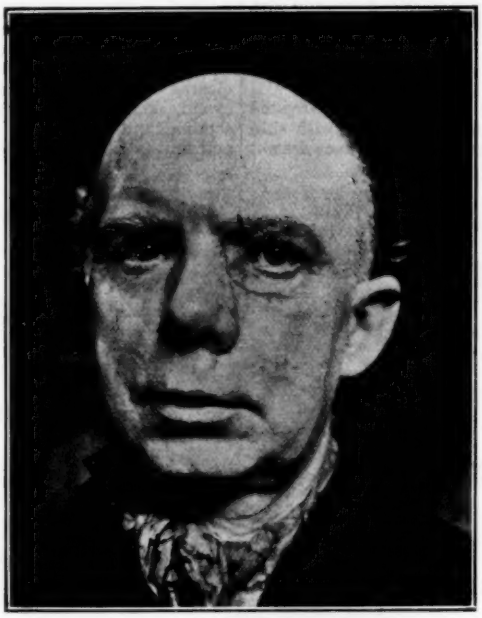
In Moure's operation hæmorrhage can be well controlled, free access is obtained directly on to the point of origin of the neoplasm, and it can, in many cases, be widely removed. Recovery is rapid. There is no blemish, and no interference with speech or swallowing. Recurrences can be more easily observed, and their treatment is facilitated by this operation. I feel very confident that any surgeon who becomes acquainted with this operation will seldom, if ever, perform another excision of the upper jaw for malignant disease in this region. The records of the two following cases will confirm

[2] C. H. Fagge in Burghard's System of Operative Surgery, vol. ii., p. 181. London: Hodder and Stoughton. 1914.

this. In the first, an endothelioma, there has been no recurrence of growth after five years; in the second, an epithelioma, the patient remains quite free at the end of three years.

CASE 1. *Endothelioma of the ethmoid and antrum; Moure's operation; no recurrence after 5½ years.*—The patient, a lady aged 60, consulted me in December, 1903, for polypi in the right nostril. She reported that she had undergone numerous operations for this condition during the previous four years, by means of the cold wire and electric snares. I removed, under cocaine, what appeared to be simple polypi at three sittings in 1904. In May, 1905, I found that the right maxillary antrum was quite obscure to trans-illumination, and advised the patient to let me open and inspect it under chloroform, as there was little hope of a radical cure of the nasal polypi if this sinus were diseased. This advice was declined. Removal of polypi, under cocaine, was carried out three times in 1905, once in 1906, twice in 1907, and three times in 1908. In August, 1909, the polypus looked so fleshy, and bled so freely on removal, that I had it examined microscopically and received the report that it was "an endothelioma, somewhat resembling the similar growth found in the jaws. It is not encapsuled, and therefore highly suggestive of having malignant character" (T. G. Stevens). More extensive operation was recommended and

FIG. 6.



Moure's operation. Shows a patient 7 days after operation. (Mr. F. F. Burghard's case.)

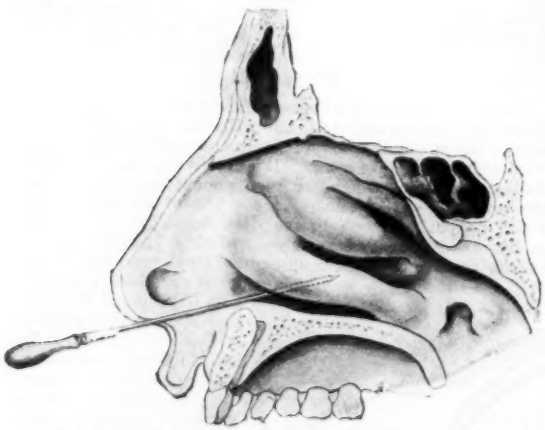
younger and more disposed to have a free operation, I should recommend that the interior of the nose should be exposed in the manner we discussed and that an attempt should be made to remove all the parts from which this disease is growing. There is no likelihood that your operation will completely clear it out." The "manner discussed" included excision of the upper jaw. The operation I had recommended was Moure's operation of lateral rhinotomy. The patient declined the risk and mutilation involved in Sir Henry Butlin's advice, and, in spite of the opinion of my senior and his high authority on malignant disease, I determined to make a trial of Moure's operation.

Operation.—This was carried out, with the assistance of Dr. Irwin Moore and Mr. H. L. Bates, at St. Albans, on July 4th, 1910—nearly seven years after the patient first consulted me and 10 months after the first manifestation of malignancy. There was much hæmorrhage, but it was under control. The right maxillary sinus was found to be filled with fleshy growth, which had eroded the floor above the alveolus in two places, destroyed the ethmoid, and extended along the roof of the nose back to the sphenoid. All was well cleared, although I was a little afraid that I had been obliged to leave a suspicious point close up to the cribriform plate in the roof of the nose.

Result.—Five and a half years have passed during which the patient has led a full and energetic life, and she is now hale and vigorous in spite of her 73 years. There has never been any trace of recurrence and not even a single polypus. The interior of the nose is moist and healthy, there is no scabbing, there is a clear view into the ethmoidal and sphenoidal cavities, and a large opening from the nose into the antrum. The patient has the full use of her alveolus, and, as she is well provided with sound teeth, she uses no tooth plate.

The patient was shown before the Clinical Section of the Royal Society of Medicine three years ago (Feb. 14th, 1913) and at the Clinical Congress of American Surgeons on July 29th, 1914, when it was universally agreed that it was difficult to detect any scar. Her only complaint is of slight numbness of the side of the face.

FIG. 7.



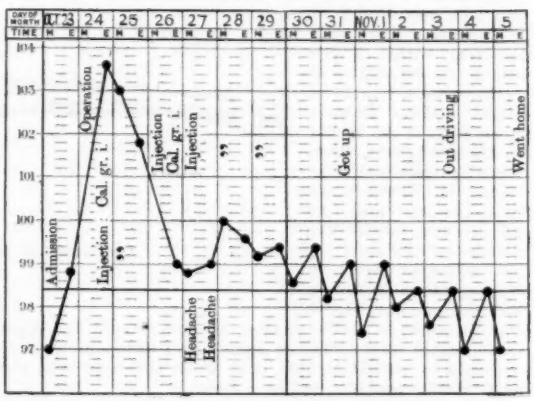
Exploratory puncture and lavage of the maxillary sinus from the inferior meatus.

declined. But in November the opinion of Mr. S. G. Shattock was taken as to the microscopical specimen. He agreed that it was a typical specimen of lymphendothelioma, and this was further confirmed by the late Sir Henry Butlin, who pointed out that on our present knowledge prognosis in regard to this type of growth is almost impossible, some cases recurring rapidly, while others give excellent results.[3] On Nov. 10th, 1909, the patient was placed under chloroform and the right ethmoid well cleared. The removed growth again showed the microscopical characters of endothelioma.

The ethmoid remained free and clear of disease for seven months, but in the summer of the following year (1910) the right nostril was found to be nearly blocked by a large, fleshy, suspicious-looking polypus. After consultation Sir Henry Butlin wrote to me as follows:—"If this lady were

[3] Vide lecture by Henry T. Butlin, THE LANCET, Oct. 19th, 1901, p. 1024.

FIG. 8.



Moure's operation. Temperature chart of cerebral irritation.

CASE 2. *Epithelioma of left maxillary antrum; Moure's operation; no recurrence after three and a half years.*—The patient, a lady aged 50, noticed a swelling of her left cheek, with grumbling pain of a toothache character, in the early part of August, 1912. In the country she was X rayed,

and the following report was sent: "X rays show a perfectly normal condition of all the facial bones. The swelling is therefore supraperiosteal. She has been taking 5 grains of iodide. The disturbance seems less localised in the bone now and more diffused in the subcutaneous tissues. I think it is of a low inflammatory character which should clear up under KI." (I quote this to show the undesirability of relying too much on X ray findings.) At the end of September, during my absence from London, the patient was seen on my behalf by Dr. Irwin Moore, who found a large, tense, deep-seated swelling in the left cheek over the canine fossa, not attached to bone and possibly cystic. Transillumination showed the left antrum to be absolutely opaque. There was some muco-pus in the left middle meatus and the middle turbinal was polypoid. The left antrum was explored with a hollow needle from the inferior meatus and washed through; no pus was expelled, but it was noted that there was considerable bleeding on withdrawing the needle. (Fig. 7.) An exploratory operation was carried out by Dr. Irwin Moore on Sept. 26th, 1912. An incision was made under the left cheek over the canine fossa, as in the first step of a Caldwell-Luc operation, and the cystic-like swelling was incised and curetted. A large amount of semi-gelatinous material was removed and the free hæmorrhage was checked by gauze plugging. The bone appeared quite healthy. A microscopical examination of the growth by Dr. d'Este Emery disclosed a glandular epithelioma.

On Oct. 15th, 1912, I found the patient was puffy all over the left cheek, with loss of definition of the upper jaw. The region of the canine fossa was soft and infiltrated. Transillumination showed complete obscurity of the left antrum. A large polypus was visible in the left middle meatus. I recommended a Moure's operation, and this advice was confirmed by Mr. F. F. Burghard, who saw the patient with me.

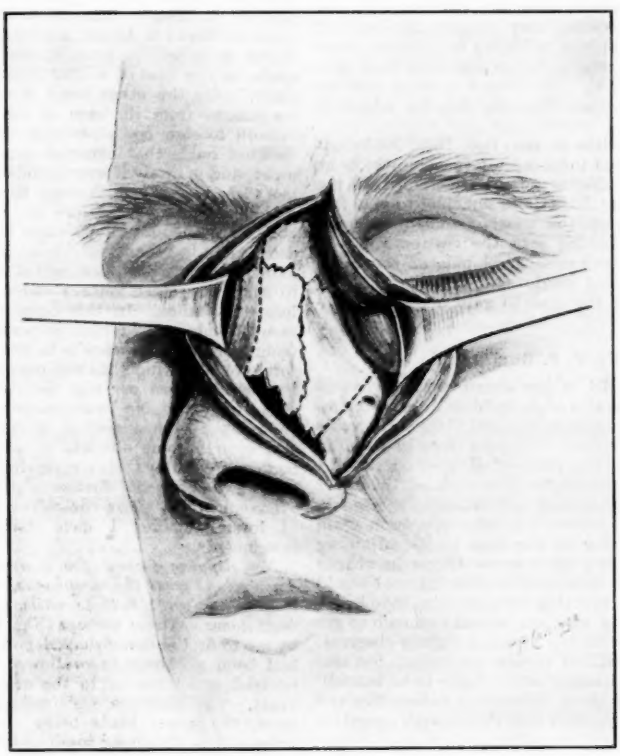
On Oct. 23rd, with the help of Dr. Irwin Moore, I performed a lateral rhinotomy. The left maxillary sinus was crowded with malignant growth which had eaten through the canine fossa and the naso-antral wall. It was well cleared from the antrum and the ethmoid, and I have a bottle containing some ounces of the removed growth. The infra-orbital nerve had to be destroyed and the lacrymal duct was exposed but left intact. The face was stitched up with horsehair. Next day the patient was markedly and alarmingly changed. Instead of being bright, vivacious, and chatty as usual, she was dull, inattentive, silent, and restless. She could easily be roused, but then her speech was hesitating and indistinct. The temperature was 101·2° to 103·6° F. and the pulse-rate was 120 (see chart, Fig. 8). She made no complaint. There were no localising symptoms. Fearing that meningeal infection had taken place through the sheaths of the olfactory nerve I asked Dr. H. Campbell Thomson to see the case and he kindly sent me the following report: "She is undoubtedly suffering from cerebral irritation and I think a little compression, but I don't think the signs at present warrant one making the diagnosis of septic meningitis. She strikes me rather as probably having some exudation either serous or possibly mixed with some blood, and this might have easily occurred as the result of the disturbance of the growth and membranes. If this is so the condition is more one of œdema, and, though very serious, is not such a bad look-out as meningitis. I should not therefore at present regard the case as hopeless, though I am not very optimistic about it." But, happily, within 24 hours there was an improvement and the temperature was falling; at the end of 48 hours it had reached 100°, and the patient was brighter and her speech was again clear. On the third day the temperature was 99° and, with re-awakened intelligence, she complained of severe headache on the left forehead. On the eighth day the temperature had become steadily normal and the patient was out of bed. Her convalescence was uninterrupted and she left the nursing home on the twelfth day. The patient was given calomel, bromide, and polyvalent antistreptococcic serum, but I do not claim any special effect from the latter. The microscopical report of the removed growth was as follows: "The growth is infiltrating the tissues freely and the latter are densely crowded with small round cells. There are no cell nests, but the growth is undoubtedly a carcinoma of a squamous-cell type."

Result.—For a few months there was a puffiness of the lower eyelid, similar to the condition we sometimes see in the upper eyelid after an external frontal sinus operation. I imagine it is connected with trophic changes or with the lymphatic circulation. This has quite disappeared. There has been no neuralgia, although I had to expose and destroy the infra-orbital nerve on the face. There is a slight amount of epiphora on cold and windy days. The lacrymal canal was recognised and left uninjured at the operation, so I think this lacrymation is due to a little displacement of the canaliculus by contraction of the scar.

FIG. 9.

Moure's operation. Shows the scar a few months after operation on the left maxillary sinus.

FIG. 10.



Moure's operation. Shows the single incision recently recommended in this operation.

Three and a half years have passed; the patient has had no trace of recurrence; the left nostril is clear and moist with a good view of the ethmoid, a large opening into the antrum, and no suppuration or scabbing in the nose. She enjoys good health. She, also, was shown before the Clinical Section of the Royal Society of Medicine on Feb. 14th, 1913, and at the Clinical Congress of American Surgeons in July, 1914. There is no disfigurement and the scar on the face is now hardly noticeable and is much less perceptible than in the accompanying photograph, which was taken within a few months of the operation. (Fig. 9.)

Both the above cases are recorded at some length for the following reasons. They show that (*a*) both an endothelioma and a carcinoma in the nasal area are susceptible of satisfactory treatment by this method of operation; (*b*) a history of some standing (Case 1), or exteriorisation of the growth (Case 2), do not necessarily invalidate the good results; (*c*) dangerous, difficult, and disfiguring operations which were formerly tried can be superseded by modern methods which in the hands of experts are easier, safer, cause no disfigurement, and promise a lasting cure. By giving a detailed description of these two cases some points of examination and diagnosis are suggested. An early diagnosis, especially in cancer of the maxillary antrum, is of great importance in securing a good result.

Some cases I have operated on more recently suggest that in most instances equally good results can be obtained by a still more limited incision. (Fig. 10.) A single cut is made from near the inner canthus of the eye, down the junction of the side of the nose with the face, to terminate in the alar groove just short of the nasal orifice. This cut is carried down to the bone, and the periosteum, with all the soft tissues upon it, is raised and peeled back as far as the line of the bridge of the nose internally, and externally as far as may be necessary towards the malar prominence. The soft tissues of the face are so lax and pliable that they can be raised and retracted outwards sufficiently to expose nearly all the area illustrated in Fig. 3. This single incision still further minimises the slight scar on the face; it does away with the puffiness of the lower eyelid which, otherwise, may persist for one or two months; there is much less tendency to epiphora; and it should be the only incision to begin with and also in any exploratory operation. The second incision, curving round below the eyelid (see Fig. 2), can be added if required.

Professor E. J. Moure writes to me (Dec. 18th, 1915) that he has now abandoned the infra-orbital incision which he had recommended in his earlier articles. He finds that the single incision shown in Fig. 10 is quite sufficient to give free access to the ethmoid region, the nasal chambers, and the sphenoid. It can be extended into the vestibule if it is found necessary to detach and raise the lobule of the nose. Moure also recommends this single skin incision and this route through the side of the nose to gain access to naso-pharyngeal fibromata.[4]

Remarks by Mr. F. F. BURGHARD.

Having read over the MS. of the above article, I would like to say that I have formed a high opinion of this operation. Since it was first brought to my notice some six years ago I have adopted it in all cases similar to those included in this paper. Since realising the value of Moure's operation I have not performed a single complete resection of the upper jaw, and I am in agreement with Sir StClair Thomson in thinking that I shall never perform this latter operation again for malignant disease arising in the nose or its adjoining sinuses; it appears to me to possess many serious drawbacks without a single advantage to counterbalance them. I would lay special stress upon the fact that patients who have had a Moure's operation done and who are unlucky enough to get recurrence, not only, as Sir StClair Thomson rightly observes, can have this dealt with without further mutilation, but also they can, even if the recurrence is so bad as to be ineradicable, go about free from those distressing deformities and defects in speech and mastication that Fergusson's operation entails.

[4] Duverger: Thèse de Bordeaux. E. J. Moure et Georges Canuyt, Revue de Chirurgie, vol. xxxiv., 1914, 10 Juin, No. 6.

ON THE REMOVAL OF FOREIGN BODIES FROM THE ŒSOPHAGUS AND BRONCHI:

WITH A DESCRIPTION OF SOME NEW INSTRUMENTS.

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SURGEON TO THE THROAT HOSPITAL, GOLDEN-SQUARE, LONDON, W.

THE direct method of examining the œsophagus and bronchi initiated by Killian, with the improvements by Brünings, Chevalier Jackson, Mosher, Guisez, Hill, and others, has proved the immense value of the œsophagoscope and bronchoscope in the surgery of foreign bodies in the food and air passages, so that during the past few years it has completely revolutionised our methods of treatment.

Improvements in instrumentarium and technique have not only greatly minimised the dangers, but enormously reduced the death-rate, in cases treated by this method. For example, in the case of foreign bodies in the bronchi, and left to themselves, the mortality used to be 58 per cent.; now, thanks to the direct method, if they are treated early, the death-rate is practically *nil*.[1] Cases, however, are still reported where death has occurred from the accidental swallowing of a tooth-plate or other foreign body, after ineffectual attempts at extraction through the mouth, followed in some instances by the external operation of œsophagotomy or gastrotomy. The blind use of bougies or probangs has also been the cause of many fatalities. The operation of œsophagotomy is by no means free from danger, for the risk of opening the cellular planes in the neck cannot be ignored. Statistics show that œsophagotomy for foreign bodies is followed by a mortality of from 12 to 20 per cent.—i.e., nearly 10 times as great as that following extraction by œsophagoscopy.

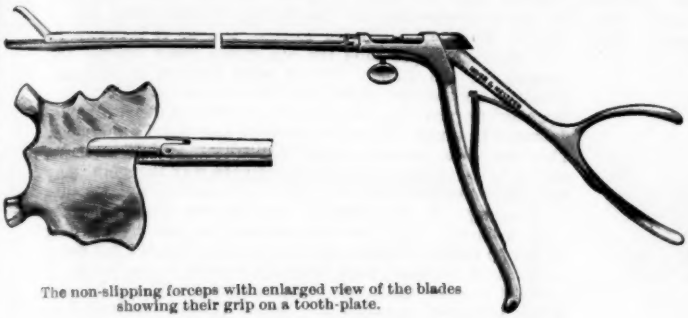
Killian has expressed the opinion that "if a foreign body is large, has sharp edges or hooks—e.g., dental plates—all attempts at extraction are dangerous and may easily lead to fatal injuries of the gullet and adjoining parts. In such cases œsophagotomy is indicated if the foreign body is situated no deeper than 24 to 26 cm. (10 inches) from the upper incisors; if deeper, gastrotomy or posterior mediastinotomy is called for (von Hacker). An exception may be made in the case of vulcanite plates without large metallic parts." On the other hand, Mosher says that opening the œsophagus from the side of the neck, for the removal of smooth foreign bodies, is now obsolete surgery. Chevalier Jackson holds that external surgery has no place in treatment, and is rarely if ever justifiable unless the foreign body has already escaped through the œsophageal wall. In all other cases, no matter how large the foreign body, if it has gone in by the natural passages it can be brought out by the same route. When swallowed it assumes the position which offers the least resistance, and it remains for the endoscopist to assist its return journey under conditions which will give least resistance. In this opinion I am entirely in agreement. Judging by recent improvements in instruments and technique, there appears to be no reason why any swallowed foreign body, which has not passed into the stomach, should not be retrieved *per vias naturales*. We may fairly hope that—with suitable instruments in the hands of the skilled endoscopist—the operation of œsophagotomy with its risks will soon become obsolete in all cases of irregular foreign bodies, no matter their size or shape.

With the object of further improving the technique and so overcoming the many difficulties met with in the removal of foreign bodies I have designed the following new instruments.

Non-slipping forceps for removing foreign bodies of any description from the œsophagus, trachea, or bronchi—e.g., tooth-plates, coins, buttons, nails, pins, fish or other bones, and fruit stones.—These forceps (Fig. 1) were originally designed by me to fit the dome-shaped portion of a tooth-plate which had been accidentally swallowed, and had remained undiscovered and impacted in the œsophagus for two and a half years. The blades are shaped on the principle of a crab's claw, the upper blade being curved and having at its extremity a triangular tooth which fits between two similar

[1] StClair Thomson: Diseases of the Nose and Throat, second edition, London, 1516, p. 744.

FIG. 1.

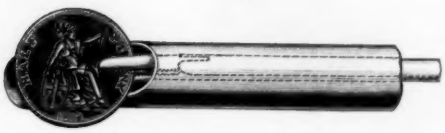


The non-slipping forceps with enlarged view of the blades showing their grip on a tooth-plate.

FIG. 2.

Extraction of coin, first position.

FIG. 3.



Extraction of coin, second position.

FIG. 4.

Collar stud grasped by its neck.

FIG. 5.

Collar stud grasped at the edge of its base by the teeth of the forceps.

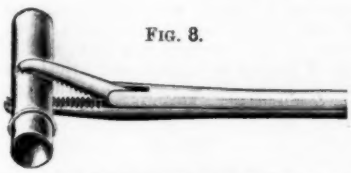
FIG. 6.

Trouser button.

FIG. 7.

Shows a carpet tack grasped securely between the teeth at the extremity of the blades, while it is also held firmly in the groove of the blades by the transverse serration. (This is one of the most difficult foreign bodies to grasp and remove on account of its receding stem and point.)

FIG. 8.



Shows how the blades will securely grasp the slippery and polished circumference of a pencil cover.

FIG. 9.

The same, with upper blade outside and lower blade inside.

FIG. 10.

The same, with both blades inside, acting as a wedge and controlled by the spring in handle of forceps. (In such a case the forceps are inserted closed.)

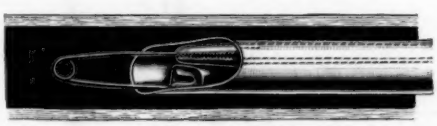
FIG. 11.

Shows closed safety-pin seized by its extremity.

FIG. 12.

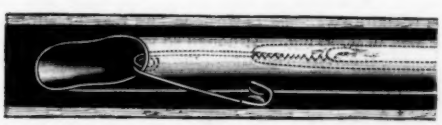
Shows open safety-pin seized by its point which lies in the groove in the centre of the blades, and is so protected that it cannot cause damage to the œsophageal wall.

FIG. 13.



Method of extraction of an open safety-pin seized by its point and drawn into the extremity of the endoscopic tube.

FIG. 14.



An open safety-pin seized by its point and drawn into the endoscopic tube while the other limb lies outside.

FIG. 15.

Shows Hill's method of closing and removing an open safety-pin.

FIG. 16.

Shows Paterson's method [2] of removing an open safety-pin.

[2] Proc. Roy. Soc. Med., vol. vi., Nov. 1st, 1912, p. 24.

ones in the lower blade. Both the blades are transversely serrated, giving greater security to their hold on a foreign body. They are, in addition, grooved down the centre, so as to prevent any lateral slipping. They

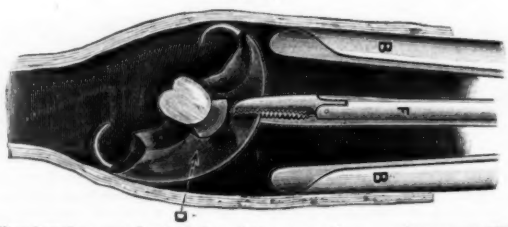
FIG. 17.

FIG. 18.

Fig. 17. Left half of vulcanite denture.
Fig. 18. Vulcanite denture impacted in the œsophagus. The illustration shows the margin of the tooth-plate, as seen by the œsophagoscope. The concavity of the plate allowed of bougies and endoscopic tubes being passed alongside it. (StClair Thomson.)

are suited for heavier work than the forceps hitherto in use. Experience has shown that the latter are too delicate in many cases as the forcep ends are apt to break when any strain is put upon them; they are also liable to slip off a foreign body such as a tooth-plate or carpet nail, not only during the process of grasping but also when the forceps are being withdrawn, owing to the foreign body or the forceps catching against the extremity of the examination tube. The disadvantage of having to change and adjust the various forcep ends, introduced by Brünings, for the several varieties of foreign bodies, is also done away

FIG. 20



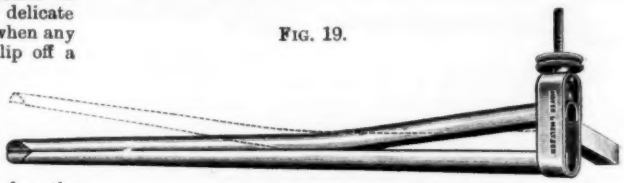
Showing the opened-out blades of the expanding œsophagoscope with impacted tooth-plate in the act of being loosened by the author' strong forceps. (William Hill.)

with. Later work with these new forceps has demonstrated the remarkable way in which they adapt themselves to the irregular surface of any kind or shape of foreign body. Any article which can pass into the œsophagus or bronchi can be grasped so securely at any point by the blades that it cannot slip from their grip. Having once grasped the foreign body the forceps will support the entire weight of the œsophagoscopic tube and handle, for the forceps blades act as a wedge to the tube and grasp the foreign body still more firmly during the process of extraction, so that the forceps tube and handle can be withdrawn *en masse* without any fear of slipping off or any risk of breaking. Although so strongly made, they do not impede the view, the diameter of the shafts being only 2 mm. or 3 mm. in the bronchial instrument and 3 mm. or 4 mm. in the œsophageal instrument. Each instrument can be supplied, if necessary, with 3 or 4 shafts of different lengths, from 25 cm. to 50 cm., the most useful being 31·5 cm. for adults and 25 cm. for children.

The following illustrations show the way in which these forceps adapt themselves to some of the foreign bodies which may be swallowed or inspired. (Figs. 2–12.)

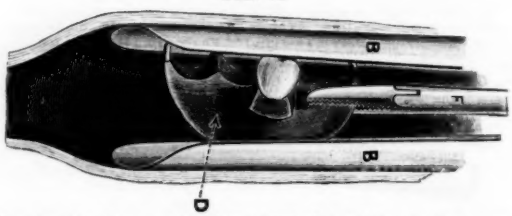
Closed safety-pins present few difficulties in their removal, and the same may be said of open ones with the point downwards, for the spring, i.e., the ring end of the pin, may be seized with forceps, and as it is drawn up into the endoscopic tube the pin closes itself against the opening of the tube. (Tubes with circular or oval extremities are the best under such circumstances.) (Fig. 25.) Open safety-pins when accidentally swallowed generally pass downwards hinge first with the catch and point uppermost. They therefore present greater difficulties, and if attempts are made to remove them in the ordinary way the point may transfix or tear into the œsophagus or bronchus, and so cause fatal injury. If the point of the pin has already become fixed or buried it may be loosened and set free by grasping the hinge portion with the forceps and pushing the pin down for a short distance until the point is seen to be released, when it may be again seized by the point with the forceps. While protected between the blades further manipulations may be carried out with less risk. (Fig. 12.) If the safety-pin is a small one it may be entirely drawn into or withdrawn through the tube by the forceps applied to the point. (Fig. 13.) This is, however, only possible when there is a certain proportion between the open pin and size of the tube

FIG. 19.



Hill's expanding œsophagoscope.

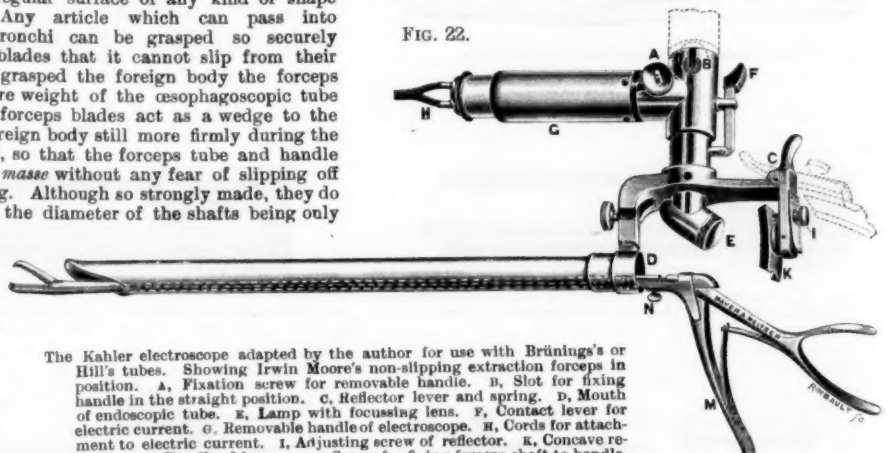
FIG. 21



Showing the sharp points of the tooth-plate hidden in the grooves protecting blades of the expanding œsophagoscope. The denture, forceps, and œsophagoscope are withdrawn *en masse*. (William Hill.)

used—e.g., a tube of 12 mm. diameter will admit a safety-pin of, say, 30 mm. length and open to the extent of 10 mm. It follows that larger tubes, and especially the oval ones of

FIG. 22.



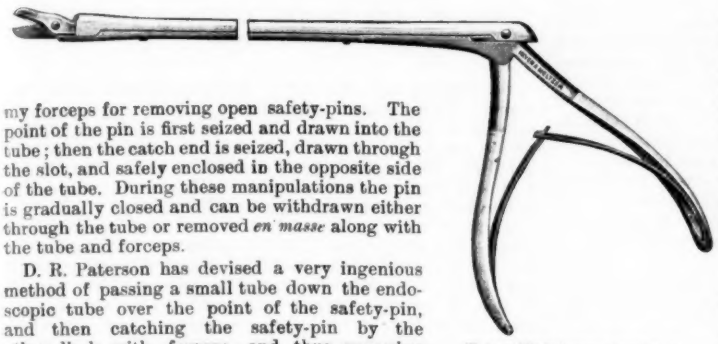
The Kahler electroscope adapted by the author for use with Brünings's or Hill's tubes. Showing Irwin Moore's non-slipping extraction forceps in position. A, Fixation screw for removable handle. B, Slot for fixing handle in the straight position. C, Reflector lever and spring. D, Mouth of endoscopic tube. E, Lamp with focussing lens. F, Contact lever for electric current. G, Removable handle of electroscope. H, Cords for attachment to electric current. I, Adjusting screw of reflector. K, Concave reflector. M, Handle of forceps. N, Screw for fixing forceps shaft to handle.

Mosher or the expanding tube of Hill (see Fig. 19), will admit larger-sized pins and those which are more widely apart.

In the case of larger safety-pins the point may be seized by the forceps and drawn up into the tube; this leaves the other limb outside, but as the sharp portion of the catch looks downwards no injury is likely to occur when withdrawn along with the tube. (Fig. 14.)

William Hill recommends his slotted œsophageal tube and my forceps for removing open safety-pins. The point of the pin is first seized and drawn into the tube; then the catch end is seized, drawn through the slot, and safely enclosed in the opposite side of the tube. During these manipulations the pin is gradually closed and can be withdrawn either through the tube or removed *en masse* along with the tube and forceps.

FIG. 23.

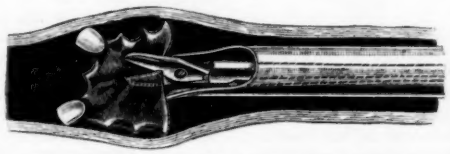


The cutting forceps or shears.

D. R. Paterson has devised a very ingenious method of passing a small tube down the endoscopic tube over the point of the safety-pin, and then catching the safety-pin by the other limb with forceps, and thus removing it safely, the little tube, forceps, pin, and endoscopic tube all being withdrawn together. (Fig. 16.)

To carry out any of these methods successfully there should be no question of the forceps slipping off the point of the pin, and for this purpose my non-slipping forceps can be thoroughly recommended. They have proved of great service in many cases during the past two or three years. StClair Thomson[3] successfully removed a tooth-plate with these forceps, which had been impacted in the œsophagus at the level of the bifurcation of the trachea for two and a half years. (Figs. 17 and 18.) He states that on account of its size it was impossible to remove the denture through the tube, so that tooth-plate, tube, and Brünings's handle were all removed *en bloc* by the forceps, which carried the entire weight.

FIG. 24.



The illustration shows the shears cutting through a tooth-plate in the œsophagus.

William Milligan[4] has reported a case in which he had great difficulty in removing an impacted fish-bone deeply situated in the gullet. After many unsuccessful attempts he was finally enabled to extract the bone with these forceps after he had failed to do so with all the others. He considers that the forceps of Brünings are really a toy when it comes to anything serious.

William Hill, in December, 1913, removed a denture which had been impacted for eight days in the gullet of a man aged 30. Its upper half was in the cricoidal pharynx, while its lower half was in the cervical œsophagus. He states that it was incredible how firmly impacted and buried it was, and though he tried many forceps in his attempts to extract it he found that none of them were strong enough even to move it. Finally, the denture was easily grasped and successfully removed by my new forceps. (Figs. 20 and 21.) He recommends[5] that these forceps should be used in conjunction with his expanding œsophageal tube in the removal of dental plates from the œsophagus. (Fig. 19.)

D. R. Paterson[6] reports the case of a man, aged 35, who had swallowed a large, irregular piece of bone (portion of a vertebra) in some soup. The mass was firmly impacted opposite the level of the sternal notch, and owing to its size and shape ordinary forceps failed to grasp it properly or move it. It was finally removed without much difficulty by my non-slipping forceps. The bone measured 23 mm. (1 inch) transversely and 17 mm. (¾ inch) antero-posteriorly.

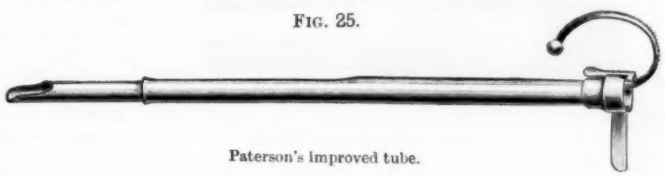
In his latest work on œsophagoscopy and bronchoscopy Chevalier Jackson[7] expresses the opinion that there will never be a "universal" forceps, and that a large selection will always be necessary for endoscopic work. So far as instruments for the removal of foreign bodies are concerned, I venture to believe that these new non-slipping forceps will prove to be the much-wanted "universal" forceps. Messrs. Mayer and Meltzer, Great Portland-street, are the makers.

To assist in overcoming the many difficulties met with in the removal of large foreign bodies I have had the Kahler electroscope adapted to Brünings's and Hill's tubes. It is more advantageous than Brünings's electroscope in exploring for and extracting foreign bodies, because it gives a wider field and permits the use and easier manipulation of larger and stronger instruments. By pressure on the spring C the concave reflector K may be turned back for the introduction of lengthening tubes or instruments, which can be performed under the direct control of the eye without the least trouble. The handle may be used in the straight as well as the angular position—a great advantage in examining patients both in the sitting and lying positions. (Fig. 22.)

Endoscopic cutting forceps or shears.—I have also designed a pair of very strong shears for cutting through tooth plates, pins, or bones which have been accidentally swallowed and impacted. (Fig. 23.) They combine both the grasping action of forceps and the cutting action of shears. For cutting purposes they are unequalled by anything at present in use, as they will easily cut through plates of vulcanite, gold, aluminium, or platinum, and the gold hooks attached to tooth-plates; it is also possible to cut through swallowed and impacted pins, and so permit of their removal in pieces. They are therefore a great improvement on the forceps which crush and break up but do not cut a tooth-plate.

When a tooth-plate is swallowed it generally turns to the position or diameter which offers the least resistance to its passage, and if it reaches the stomach it will generally pass safely out of the body. But it may be turned into a broader diameter by the contraction of the œsophagus or meet with one of the narrower portions of the gullet, where it may be checked and become impacted—namely, the post-cricoidal pharynx (above the mouth of the œsophagus), the constriction due to the projection of the left bronchus, or the phrenic narrowing. In such cases it is the work of the œsophagoscopist to coax it back again to its narrower diameter, either by a gradual rotation—e.g., by seizing the corner of the denture by the forceps and so loosening its impaction (as shown in Figs. 20 and 21), or, if this procedure fails, it is possible to cut through the denture and remove it in two or more pieces.

FIG. 25.



Paterson's improved tube.

Killian[8] has reported the case of a large vulcanite plate which he was able to reduce in size and remove in three pieces by cutting through it with a specially made cautery knife. This appears to be a most dangerous method and cannot be recommended.

These forceps shears are so constructed that a tooth-plate is grasped and drawn up between the cutting blades towards the operator and away from its impacted position, while the

[3] THE LANCET, Jan. 4th, 1913, p. 16.
[4] Proc. Roy. Soc. Med., vol. viii., Dec. 4th, 1914, p. 40.
[5] Article on Foreign Bodies in the Œsophagus, Encyclopædia of Medicine and Surgery, London, 1912.
[6] Proc. Roy. Soc. Med., vol. ix., Dec. 3rd, 1915.
[7] Peroral Endoscopy and Laryngeal Surgery, 1915.
[8] Deut. Med. Woch., Dec. 20th, 1900.

cutting action is taking place. This is an advantage possessed by no other instrument. Any damage to the œsophagus and adjoining parts by the foreign body being pushed further away is therefore avoided or lessened. When the denture is grasped it should be drawn up by the shears against the open extremity of the œsophagoscopic tube, where it may be steadied during the cutting process, while at the same time counter pressure may be exerted by the tube against the denture. A similar procedure is advised when cutting through an impacted pin or fish-bone. A slight turn of the wrist to the left hand side during the cutting will greatly facilitate the satisfactory working of the instrument. A long hook probe may be used in addition, if necessary, to assist in fixing the foreign body against the extremity of the tube during the cutting. Large tubes with circular extremities or the oval tubes of Mosher are better adapted for this purpose in most cases than the beaked tubes.

Paterson's improved tube is especially useful, for in this the inner tube is beaked to facilitate introduction and act as a pilot, and when this is withdrawn it leaves the cylindrical end of the outer tube which is easier to manipulate. (Fig. 25.)

E. A. Peters, in April, 1912, with these shears successfully removed the half of an upper tooth-plate which had been accidentally swallowed and impacted in the œsophagus of a woman at the level of the bifurcation of the trachea for eight days. The patient had the two natural canines, and probably two bicuspid and two molars on the remainder of the plate. At the left upper corner of Fig. 26 the cut made by the shears is seen. The denture, which was securely grasped by the shears, shows that it had been half cut as it was drawn up between the shear blades, whilst it was at the same time released from its impacted position before the cutting process had been completed, thus enabling the operator to remove the plate without the necessity of completing the cut. It is important to note that the denture was impacted in its broadest diameter, and had the cut been completed it would have reduced the diameter by a quarter of an inch. No damage was done to the œsophagus, and the patient made a speedy recovery.

FIG. 26.

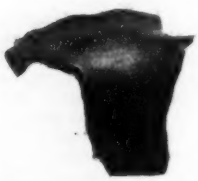
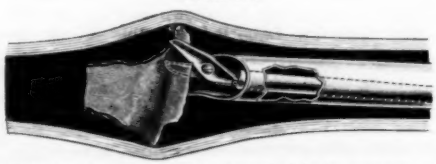


FIG. 27.

Portion of tooth-plate removed by Peters, showing its upper surface in Fig. 26 and its lower surface in Fig. 27; the denture measured 29 mm. by 22 mm. The two central and lateral incisors had been broken off before the denture was swallowed.

FIG. 28.



The illustration shows the denture impacted in its broadest diameter and the shears in the act of cutting off the angle.

The instrument measures 31·5 cm. in length and 5·7 mm. on cross-section of the shaft. As the cutting ends are at such a long distance from the hinge it must be very strongly made of the finest and best tempered Sheffield steel. In this respect Messrs. Mayer and Meltzer have carried out my suggestions with their usual skill and care, so that the instrument they have made is practically unbreakable. At first sight it might appear that the element of strength had been too much insisted upon, but I have found that the elliptical shape in which they are made causes least obstruction to the view and does not materially interfere with any operative procedure.

Wimpole-street, W.

ON THE PRESENCE OF LEAD IN THE URINE IN FOUR CASES OF TRENCH NEPHRITIS.

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(*From the Helen Swindells Laboratory, University of Manchester.*)

ON reading the account of trench nephritis given by Captain W. Langdon Brown, R.A.M.C. (T.F.),[1] it seemed to me that the incidence of the disease pointed to the possibility of its being attributable to the large use of tinned foods in the diet. By the kindness of medical friends in Manchester I was enabled to procure some specimens of urine and I proceeded to examine them for metallic poisons.

There is no reliable rapid method of detecting metals in urine. For the purpose of this investigation I have relied on the direct chemical examination of the ash after evaporating the urine to dryness and igniting the residue. This method is tedious and troublesome but reliable. I have tried other methods as described below, but so far they have not led to any considerable shortening of the process. In every case, however, they yielded the same results as the direct method and thus serve as controls.

I have so far examined five specimens from trench nephritis (two of them from the same case at different times); two specimens from ordinary nephritis, each of them the mixed urines from two cases; and a normal urine to serve as a blank experiment. On referring to the table it will be seen that lead was present in all the specimens from trench nephritis and in one of the mixed urines of ordinary nephritis (this case is being investigated further). Iron was present in all the nephritic specimens and copper in most of them. Tin was also present in Specimen 1. This was the most recent case, and contained more lead than the others. Specimen 6 from the same case a month later contained less lead, and tin was not found.

From some work which I have been doing lately, which will be published shortly, I have come to the conclusion that copper is universally present in the tissues, and I have found it in normal urine to the extent of 0·2 milligramme per litre. It may therefore be left out of account in the present investigation. The iron, again, can be attributed to the blood which was present in all cases, and possibly to the medicinal administration of iron. The presence of lead and tin in urine must, however, be regarded as abnormal. Owing to the similarity between the sulphides of copper, lead, and bismuth, and to the possibility of some of the patients having had bismuth administered to them, I have tested for this metal in three of the specimens and I have also examined the urine (Specimen 9) from a patient who was under bismuth treatment.

The constant presence of lead in these cases and the presence of tin in one of them naturally suggests the possibility of the metals being derived from tinned foods. If a solution of sodium chloride be boiled for 10 minutes in a stamped tobacco tin (which has no joints) it does not extract any metals. If, however, a small piece of solder is placed in the tin containing the solution, boiling for 10 minutes causes some lead and tin both to go into solution. Again, if a salt solution is boiled in an ordinary fruit or meat tin, it extracts traces of lead and tin, and if the solution contains the slightest trace of acid the amount of metals dissolved is markedly increased.

The methods adopted in the analysis were as follows.

1. *The direct chemical method.*—The urine is evaporated to dryness and ignited, destruction of the organic matter during evaporation being facilitated by the addition of nitric acid or of hydrochloric acid and potassium chlorate. The ash is dissolved in hot dilute hydrochloric acid and the solution saturated with sulphuretted hydrogen. (The sulphides had in each case a brown colour.) The sulphides are collected on a filter and the filtrate is tested for iron, &c. The precipitate is dissolved in a small quantity of hydrochloric acid containing a few drops of nitric acid, and the solution boiled to expel chlorine. The excess of acid is

[1] THE LANCET, Feb. 19th, 1916, p. 391.

Table giving the Results of Examinations of Specimens of Urine.

Specimen.	Case.	Duration.	Reaction.	Sp. gr.	Alb. grms. per litre.	Amount used c.c.	Hg	Pb	Bi	Cu	As	Sb	Sn	Fe	Zn	Method.
1	Trench nephritis.	5 weeks.	Alk.	1020	7·94	(*a*) 750	0	+	—	+	0	0	+	+	?	Direct.
						(*b*) 600	0	+	—	—	—	—	+	—	—	Pb by electrolysis, after destroying organic matter. Sn in residue.
6	Trench nephritis (same case as No. 1).	9 weeks.	Acid.	1012	1·62	(*a*) 1000	0	+	—	0	—	—	0	+	0	Direct.
						(*b*) 400	0	+	—	0	—	—	0	+	—	Al method.
						(*c*) 500	0	+	—	0	—	—	0	—	—	Mg method.
4	Trench nephritis.		Alk.	1025	2·80	(*a*) 750	0	+	0	+	—	—	0	+	—	Direct.
						(*b*) 400	0	+	—	+	—	—	0	+	—	Al method.
						(*c*) 500	0	+	—	+	—	—	0	+	—	Mg method.
5	,, ,,	11 weeks.	Alk.	1012	0·49	(*a*) 750	0	+	0	+	—	—	0	+	—	Direct.
						(*b*) 500	0	+	0	+	—	—	0	—	—	Al method.
						(*c*) 500	0	+	—	—	—	—	0	+	—	Mg method.
7	,, ,,	23 weeks.	Acid.	1017	9·57	(*a*) 500	0	+	0	+	—	—	0	+	—	Direct.
						(*b*) 300	0	+	0	+	—	—	0	—	—	Al method.
3	Acute nephritis (mixed specimen, 2 cases, children).		Alk.	1025	1·60	750	0	0	0	0	0	0	0	+	—	Direct.
8	Acute nephritis (mixed specimen, 2 cases).		Acid.	1010	0·84	(*a*) 1000	0	+	0	+	—	—	0	+	—	Direct.
						(*b*) 1000	0	+	0	+	—	—	0	+	—	Direct.
2	Normal.					(*a*) 500	0	0	0	0	0	0	0	0	—	Direct.
						(*b*) 1000	0	0	0	*	0	0	0	0	—	Direct.
9	Dyspepsia. (Patient taking bismuth.)					400	0	?	+	+	—	—	0	0	—	Direct.

\+ Present. 0 Absent. — Not examined for. * Trace.

almost neutralised by ammonia and the sulphides are again precipitated with sulphuretted hydrogen. The precipitate is allowed to settle and is washed by decantation (or it might be centrifugalised). It is then heated with caustic soda solution and the mixture filtered, the filtrate being tested for tin. The precipitate proved always to be soluble in hot dilute nitric acid, and from this the absence of mercury was inferred. The second precipitation with sulphuretted hydrogen may also be carried out in the presence of alkali instead of acid, in which case tin will not be precipitated, and if present will be found in the filtrate from the other sulphides.

The precipitate might thus contain bismuth, lead, or copper, and it is not always easy to identify these in the small quantities present. The method adopted was as follows. The solution of the sulphides is evaporated to dryness in a small evaporating dish, care being taken not to overheat the residue. One drop of a solution of potassium iodide is then placed on the dry residue. If bismuth is present there is formed the black bismuth iodide together with a red complex potassium-bismuth compound. Lead is indicated by the formation of the bright yellow iodide. If copper is present, or if there is a trace of free acid adherent to the residue, free iodine will be liberated and will also give rise to a yellow colour. This can be distinguished from the lead iodide by treatment with chloroform, which dissolves the free iodine but leaves untouched the lead iodide. Copper is recognised by the blue colour formed by the treatment of the residue with one drop of ammonia solution.

The identification of bismuth in the residue thus depends on the formation of a black iodide and the detection of copper on the blue ammonio-cupric compound. The identification of lead in the absence of bismuth depends on the formation of the yellow iodide. The identification of lead in the presence of bismuth is more difficult, and I have not yet completely satisfied myself as to the absence of lead in Specimen 9. The iodide test was not applied in Specimens 1 and 6. In Specimen 1 a precipitate was obtained with sulphuric acid, and in No. 6 the identification depends on the absence of copper, the absence of bismuth being assumed. The absence of arsenic and antimony in Specimens 1 and 3 was proved by the hydrogen test. This test was not applied in the other specimens. The identification of tin in No. 1 depends on the formation of a sulphide soluble in caustic soda solution and re-precipitated as a yellow precipitate on acidifying. This precipitate was dissolved in strong hydrochloric acid and after dilution reduced by zinc and platinum. The solution gave a faint precipitate with mercuric chloride. The absence of tin (and of arsenic and antimony) was shown in the other cases by the absence of a sulphide soluble in alkali.

In one case I tried, using 500 c.c., whether the coagulation of the albumin could be used for the separation of the metals from the bulk of the urine. The result was unsuccessful, lead being found both in the coagulum and in the filtrate. The albumin was estimated by weighing the dried coagulated albumin from 100 c.c.

2. *Electrolysis.*—Owing to delay in procuring necessary apparatus it has not been possible to apply electrolytic methods satisfactorily as yet. It was applied in Specimen 1 after destruction of the organic matter with hydrochloric acid and potassium chlorate, a rotating platinum crucible being used as kathode. A distinct deposit of lead was obtained, and tin was found in the remaining fluid. Electrolysis was also applied to the solution of the sulphides in Specimen 7. A deposit of copper was obtained at a potential of 1 volt. Afterwards the potential was raised to 1·6 volts and a deposit of lead was obtained. This method is being further investigated, as it is of considerable value in separating different metals.

3. *Aluminium method.*—If an acid solution containing tin, lead, and copper be shaken up with aluminium powder in a shaking machine, the metals are separated quantitatively in the metallic form, and can be filtered off with the aluminium, the filtrate being free from them. The same is true if traces of lead and tin be added to normal urine, the aluminium bringing down the whole of the added metals. Treatment of the nephritic urines with aluminium for several hours was, however, not so satisfactory. In each case the greater part of the lead and copper was recovered, but there still remained some in the filtrate. Organic substances were also precipitated and the filtration was tedious. In each case where this method was tried the precipitate was examined chemically as above and, except in Specimen 7, the filtrate was also examined. The results thus serve as controls to the direct method.

4. *Magnesium method.*—This consists of treating the urine with magnesium powder, the whole being vigorously stirred with a mechanical stirrer. The magnesium was added until the cessation of effervescence. This method is successful in artificial solutions, but in the albuminous urines there were the same difficulties as with the aluminium method, and filtration was even more difficult owing to the precipitation of proteins, &c. Of the two methods the aluminium method is the better.

So far I have not attempted any quantitative estimation of the lead present. Such an estimation would depend on a colorimetric method, utilising the sulphide; but before this can be considered satisfactory, effective means must be taken to ensure the absence of copper (and bismuth). I am hoping that the electrolytic method will be useful in this connexion.

It is obviously impossible to draw any conclusions from four cases only. The presence of lead in the urine may have no significance in the etiology of the disease *qua* "nephritis," but may be of significance *qua* "trench." It is possible that lead may be present in the urine of soldiers in the

trenches more frequently than in that of civilians at home. I have not yet examined any specimens from soldiers other than these nephritic cases, but am hoping to do so shortly.

I have published these results as a preliminary communication, to draw the attention of others, especially of those who see these cases in the early stages, to the subject, so that they may consider the possibility of some association between this disease and the excessive use of tinned foods, especially of such foods as are cooked in the tins themselves.

For the analysis of Specimen 6 I am indebted to Dr. D. T. Harris. I have also to express my thanks to Major R. B. Wild, R.A.M.C. (T.F.), for Specimen 1 (Ducie Avenue Military Hospital); to Captain F. E. Tylecote, R.A.M.C. (T.F.), for Specimens 5 and 6 (Withington Military Hospital); to Dr. E. M. Brockbank for Specimens 3, 4, 7, and 8 (Manchester Royal Infirmary); and to Dr. Harris for Specimen 9.

PS.—I have just seen the communication of Mr. R. L. Mackenzie Wallis [2] on the examination of the specimens of urine from the cases under the care of Captain Langdon Brown. He, using a different method, was unable to detect the presence of any heavy metals.

Manchester.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

AN UNUSUAL CASE OF ŒSOPHAGEAL CAST.

BY F. H. JACOB, M.D. LOND., M.R.C.P. LOND.

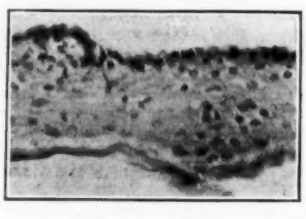
THE unusual nature of the following case made me think it worth putting on record.

The patient, who had recently enlisted in the army, came to see me on account of a sore throat. The pharynx presented a grey, sloughy appearance. He brought with him some stuff which he had vomited on the previous day. On floating this in water I found it to consist of a cast of the whole of the œsophagus and of the pharynx and naso-pharynx. I cut sections and found it to consist of the epithelial lining of the œsophagus. Reproductions of photographs are shown of the cast itself and of a section through the thickness. The sections were taken from both ends of the cast and show identical structure of both extremities.

FIG. 1.

Reproduction of photograph of cast 11 inches long.

FIG. 2.



Micro-photograph of section through the thickness of the cast.

[2] Journal Royal Army Medical Corps, March, 1916.

The patient gave a history of having had two similar attacks previously—one a year ago and the other six years ago. He told me that he had not been able to swallow properly for six years, something always seemed to catch him in the throat. When eating meat he had to chew it thoroughly and never hurry. Each attack commenced during a meal, and felt as though something sharp was cutting his throat, then he vomited up blood, and after that the skin. The throat was very sore for a fortnight, then got right again. I saw him ten days later, and his throat was then nearly recovered. He had had no previous illness except eczema as a baby. The Wassermann reaction was completely negative.

Appended are notes of some previous cases.

1. In THE LANCET of Jan. 5th, 1901, p. 26, Dr. Nathan Raw recorded a case of membranous œsophagitis with expulsion of a complete cast of the œsophagus, of which a coloured illustration was given in the text. In this case the œsophagitis was ascribed to drinking neat brandy, whisky, and rum. Raw mentions in his paper that exfoliative or desquamative inflammation of the œsophagus, or "œsophagitis dissecans superficialis" was first described by Birch-Hirschfeld in Ziemssen, vol. viii., p. 140. This case of Raw's was submitted to gastrostomy and died.

2. At the Royal Society of Medicine, Section of Laryngology, meeting on April 4th, 1913, Mr. G. N. Biggs showed an almost complete cast of the epithelial lining of the œsophagus, which was vomited three days after the patient had swallowed one ounce of chloroform. Rectal feeding was employed, and bismuth, lanolin, and paroleine given every four hours by the mouth. Œsophagoscopy three months later gave no indication of contraction.

3. Osler and McCrae, second edition, 1915, p. 80. John McCrae describes various causes of phlegmonous œsophagitis; records a case reported by Neisser [1] and a case of Stern's, where a cast 13 centimetres long was expelled; alluding also to Birch-Hirschfeld's original case "in which a 20 centimetre cast was expelled three days after the onset of the first œsophageal symptoms; the patient promptly recovered."

4. There is a short allusion in the "Twentieth Century Practice of Medicine" by Fitz, of Boston, which adds little to the previous.

Nottingham.

A CASE OF PLEURO-PNEUMONIA TREATED WITH PHYLACOGEN.

BY FRANK COLLINS, L.R.C.P. LOND., M.R.C.S.,
DEPUTY CORONER FOR THE METROPOLITAN DISTRICT OF ESSEX, ETC

THE patient was a highly neurotic (partly alcoholic) woman of about 40, under observation by an eminent cerebral specialist, who had diagnosed recently a glioma of the optic tract. I was told by the patient's husband that the pain in the head had been "terrible." There was certainly impaired articulation, and before the attack I am about to refer to there were frequent subconscious flashes of light and flame in both eyes with the paroxysms of pain.

I was called one night because the patient was "choking for breath and in great pain in her side." On examination I found what I diagnosed provisionally as a metastatic development at the base of the right lung, which had caused the localised acute pleuro-pneumonia in that region. By the second day of my seeing the case, apparently the third or fourth of the onset, there was evidently a pleuro-pneumonic explosion in the whole of the right lower lobe, and this had extended to the left lower lobe. The temperature was only 101° F., but the impaired oxygenating capacity of the lungs was obvious from the strained efforts at inspiration and the patient's constant, distressing appeal: "Oh, if I could only fill my lungs and take a good deep breath!" The pulse was hard, regular, 128–130. The face and lips were cyanosed.

It was not a fair test for the phylacogen, but I used it tentatively in the hope that it might do good, and at any rate it was not likely to make the prospect worse, under the circumstances. I began with an injection of 10 minims, continuing with the usual treatment, which I need not detail beyond mentioning that oxygen was given at intervals of three to four hours for about 10 minutes

[1] Berlin. klin. Wochenschrift, Jan. 3rd, 1910.

regularly. Thermofuge was applied from the start on a back "breast-plate," and hypodermic injections nightly of heroin 1/6th grain and atropin 1/100th grain were given throughout, sometimes twice or thrice daily. By the third day of my attendance both lungs were dull and non-aerated from the bases to the middle of the scapulæ, and friction sounds were distinctly audible at the upper limit and just below it. The consolidation was extending, in spite of the phylacogen, which I daily increased by 5 minims. Each injection was followed within an hour or two by giddiness, violent retching, and what the patient described as "pins and needles all over her." These apparently disadvantageous symptoms seemed hopeful as showing there was an energetic reaction somehow to the phylacogen, so I persevered. After the fourth injection the dullness and friction remained stationary. The temperature fell to 98° and the cyanosis became less marked, though the apnœa continued and was only relieved by more frequent oxygen inhalations. Collapse was dangerous, but I went on. By the sixth injection, the last two of 30 minims each, there began evident clearance of the lungs at the upper limit of dullness. Friction remained for three or four days, but from then onwards the consolidation rapidly disappeared. I gave no more phylacogen. By the tenth day the air-stream again reached the bases of both sides; the pulse fell to 90 and respiration became normal. The attack was over, and only general weakness and the usual "pneumonia wreckage" of dilated heart, anæmia, and exhaustion remained. Curiously enough, all the cerebral symptoms, with the exception of the sibilant speech, completely vanished.

I gave the patient up as doomed on the fourth visit, both because of the advancing symptoms and the difficulties she raised in the way of treatment. She refused nurses, she insisted on getting out of bed and even staggering about the room, and she would not take fluid food. From my first visit she said she knew she was going to die, and I think she believed it, but though I thought the same myself I tried to keep her hopeful in spite of the supervention on the fifth day of a distinct cloud of albumin, scanty excretion of urine, and œdema of the feet and ankles. The lungs became quite clear, and were so for a fortnight after the commencement of convalescence; the blood-stained sputum, of which there was at no time any considerable quantity, became absent

PS.—Since the above was written the patient has died; all the pneumonic symptoms entirely cleared up, and she had begun a hopeful convalescence. Death occurred from acute meningitis and exhaustion.

Wanstead, Essex

AT the last meeting of the Bideford (Devon) board of guardians the resignation was accepted, with much regret, of Dr. Charles Sinclair Thompson, who has been medical officer and public vaccinator of the district for the past 40 years.

A MARY MURDOCH MEMORIAL FUND.—The Hon. Mrs. Franklin writes: "Dr. Mary Murdoch's friends have expressed a wish to contribute towards a memorial which would perpetuate her memory among medical women even after the generation of those who have known and loved her has passed away. Her high professional standard, the inspiration and encouragement she was to her colleagues and friends, her work for women, and her belief in them and the part they can take in the nation's welfare, are well known. At this moment, when the demand for medical women is far greater than the supply, it is felt appropriate to her memory as well as to the nation's needs, that a memorial should be chosen which would help some young medical women in the first years of their practice. While actual details have yet to be settled, it is intended that a fund shall be raised to found a bursary or bursaries on these lines, in connexion with the London (Royal Free Hospital) School of Medicine for Women. It is in the belief that there are many who would wish to help in such a memorial that it has been decided to make its existence widely known." The following are acting as the committee of the Memorial Fund: Miss L. B. Aldrich Blake, M.D., M.S., Dean of the London School of Medicine for Women; Mrs. Edwin Gray, National Union of Women Workers; Mrs. H. Fawcett, LL.D., National Union of Women's Suffrage Societies; Miss Jane H. Walker, M.D.; Miss Helen Webb, M.B.; Miss L. Martindale, M.D., B.S.; Miss F. M. Edmonds, M.D., B.S.; Miss F. Stacey, M.B., B.S.; Miss S. Watt; and the Hon. Mrs. Franklin, honorary treasurer of the fund, 50, Porchester-terrace, London, W. (to whom contributions may be sent).

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF PATHOLOGY.

Bacteriology of Cerebro-spinal Fever.—Transplantable Tumour of the Guinea-pig.—Toxic Hepatitis.—Treatment of Wound Infections.—The Mechanical Causation of Appendicitis.

A MEETING of this section was held on May 2nd, Professor F. W. ANDREWES, the President, being in the chair.

The PRESIDENT gave a short account of the Bacteriological Results in 11 Consecutive Cases of Cerebro-spinal Fever admitted to St. Bartholomew's Hospital during the first four months of 1916. Only one was a military case; of the civil cases four were under 4 years of age and six were older children or adults. The type of coccus was determined in each case by agglutination with sera supplied from Millbank by Lieutenant-Colonel M. H. Gordon. The two earliest cases proved to be Gordon's Type I., the remainder Type II., except one case in an infant which could not be referred to any known epidemic type. The pharynx was always examined and the meningococcus was found in every case, twice in great abundance, sometimes only in small numbers. In each case the pharyngeal and spinal strains were compared by agglutination and were invariably referable to identical types, indicating that the pharyngeal infection was an integral part of the disease. Most of the cases remained carriers for several weeks, one for more than 70 days. Treatment was by repeated lumbar puncture, with the new Lister Institute serum, prepared with numerous diverse strains isolated during last year's epidemic. The serum had been successful, for though 4 cases out of 11 died (mortality 36·36 per cent.), 2 of these were infants under a year old and one a child of 3 years. Only one adult died, of streptococcal septicæmia following mastoid suppuration, after the meningococcal infection had been overcome. In cases over 4 years old the mortality was only 14·3 per cent. The improvement following the serum was in most cases immediate; in 3 severe cases in which it was given on the second or third day the patients were convalescent in 48 hours. One baby aged five months recovered. Blood culture was carried out in 3 early cases. Twice it was negative and once positive, the meningococcus being recovered from every tube. This case recovered promptly after serum had been given (intravenously as well as intrathecally). In a fatal case the coccus was also recovered from the heart's blood after death.

Dr. J. A. MURRAY read a short paper on a Transplantable Tumour of the Guinea-pig. The tumour grew in the inguinal region, was fatty, fibrous, and slightly cellular, and was regarded as a fibro-lipoma. It was grafted into a large number of guinea-pigs through several generations. After a long latent period it grew very slowly. This long period of latency was an extraordinary feature, for sometimes, even after two months, fresh tumours formed. Another striking feature was the size it attained, some of the tumours weighing little less than the animal. The cells of the tumour showed marked metachondritic changes. Having regard to its transplantability and the finding of tumour cells in a pulmonary arteriole in one instance, the term liposarcoma seemed to fit it most closely.

Dr. B. H. SPILSBURY exhibited and described a series of livers affected by Toxic Hepatitis. The first was from a case of tetrachlorethane poisoning, and showed irregular fibrosis, cellular destruction, very marked regeneration in one part, and an almost complete absence of fat. Another was from a case of poisoning by dinitrobenzol. It showed irregular fibrosis, little degeneration of the cells, much bile-duct proliferation, and no fat, and was obviously an example of a very chronic form of toxic hepatitis. A third liver had been poisoned by trinitrotoluene. It was reduced in size, and showed irregular fibrosis and very advanced fatty degeneration. The liver from a case of acute yellow atrophy was shown as a contrast. Its particular features were the absence of fat in liver cells and the marked fatty degeneration of the endothelial cells.

Dr. W. PARRY MORGAN, in a paper on the Treatment of Wound Infections, dealt with Sir Almroth Wright's proposal, made on the ground of laboratory experiments, to substitute

for treatment by antiseptics treatment by saline solutions. He questioned the interpretation of these experiments, and maintained that the laboratory did not justify the changes proposed. In the first place, with regard to the use of hypertonic saline, he reviewed Sir Almroth Wright's experiments, and contended that they did not show any such drawing power as was ascribed to salt, and that the only sense in which salt could be said to draw water to itself was that recognised when such a process as osmosis took place; and, further, that salt could not draw lymph to itself even by osmosis. He then dealt with the ways by which the flow of lymph could be promoted, and suggested that hypertonic salt solution might in some cases do this by causing an osmotic diffusion of water out of the cells, the shrinkage of which would cause the opening up of lymph channels, just as the ground is fissured in dry weather. The lymph would then have free passage to the surface, and any lymph-bound condition be relieved. But this effect would not be permanent, and often would not be seen at all. Dr. Morgan then pointed out that hypotonic fluids, such as water and hydrogen peroxide, would act in the opposite way to hypertonic, causing swelling of the cells and possibly a diminished flow of lymph, and therefore suggested that antiseptics should be diluted with an isotonic fluid such as physiological saline and not as is usual with water. He next discussed the question of chemotaxis, and contended that the method of estimating it was fundamentally faulty; and that the experiments could not possibly justify the claim "the polynuclear white corpuscles are carried forward by a chemotactic movement in the direction of the free surface upon which the physiological solution has been imposed." On the other hand, he agreed that the experiments showed that antiseptics, bacterial suspensions, and above all hypertonic saline inhibited the emigration of leucocytes, but in this connexion pointed out that of more practical significance than the laboratory experiments were the observations made on the wound itself as to whether there was a good flow of laudable pus. If there was any after an application, such application could not materially affect the physiological processes. This test showed that antiseptics did not interfere to any extent with the flow of pus, but that hypertonic saline would give us a wound as free from pus and clean as meat. He inferred from this that hypertonic saline renders ineffective the only defence against the streptococcus and staphylococcus, whilst with the application of an antiseptic or of physiological saline, this defence comes again into action. Pus, as long as it was not "corrupted," was a good thing in a badly infected wound, but it should not be allowed to remain there long enough to become corrupted. Hence the necessity for washing away pus, and, if possible, destroying the organisms which corrupt it. In regard to washing out a wound by constant irrigation, the fluid should be delivered at blood temperature, as otherwise the activities of the leucocytes would be diminished. The attempt to destroy organisms was made in two ways: (*a*) By washing with antiseptics, and (*b*) by the application of antiseptic dressings. In washing out the wound, the portion of the wash which was not immediately drained away and the film of pus which still adhered to the surface should be considered. In both cases the antiseptic would be in great excess, and would have to be rapid in its action to be effective. From his experiments he concluded that here the neutral hypochlorous solutions were very efficient whilst carbolic acid was comparatively ineffective. In the case of the dressing the pus would tend to be in excess and the action of the antiseptic would be prolonged. Here his experiments showed that hypochlorous solutions would be practically useless, whilst carbolic acid would in its action on the organisms be fairly efficient. The experiments by which he showed this were as follows: pus showing one or two organisms per field of a film was mixed with an antiseptic and incubated. If the organisms became more numerous it was clear that they grew in spite of the antiseptic. In these experiments he showed that four parts of pus and one of antiseptic grew organisms when the following antiseptics were used: carbolic acid, 1/60; mercuric salts, 1/200; iodine, 1/200; chloramine, 1/20; hypochlorous solutions, 1/200 available chlorine. It was inferred from this that it was unreasonable to expect enough antiseptic to diffuse into the tissues to inhibit the growth of organisms, still less to kill them. In similar experiments where organisms were added to sterile pus or to blood the antiseptics were found to be much more efficient, so Dr. Morgan inferred that they would be specially useful when applied to recent wounds and to prevent contamination from without. He considered, in conclusion, that antiseptics, as such, could not sterilise the tissues and would not be likely to do more than reduce the number of organisms on the surface of a wound. This they could do, and since it could hardly be possible that the depth and intensity of the tissue infection would be independent of the virulence and proportion of the surface organisms it would be an important gain, and was the rôle of the antiseptic in antiseptic treatment.

Professor S. G. SHATTOCK communicated a paper dealing with the Mechanical Causation of Appendicitis, based upon the examination of a series of appendicular concretions, and of the contents of 125 appendices in persons dying from various causes, 100 being over 40, and 25 between the ages of 15 and 25 years. Any such mechanical cause, if it is adequately to account for the alleged increase in appendicitis, would have to be (1) of recent introduction; and (2) of a kind that would extend to all classes of the community. One such that had been suggested was the ingestion of particles of the silica glaze detached from the enamelled hardware now in such general use. These particles were, of course, absolutely insoluble in the alimentary canal. Professor Shattock had not found a single flake of enamel in any of the many concretions he had examined, nor in the contents of any of the 125 appendices studied. In regard to the possible injury producible by the ingestion of silica in miners, Dr. W. Watkins-Pitchford, the present director of the South African Institute for Medical Research, Johannesburg, had kindly obtained for him the following information: "Dr. F. Aitken, the superintendent of the Miners' Phthisis Sanatorium, near Johannesburg, states that 537 cases of miners' phthisis have passed through this institution without his having seen a single case of appendicitis amongst them, nor has he noted any history of attacks before their admission. Dr. H. A. Loesser, the senior medical officer of the Crown Mines, has neither noticed nor heard it suggested that appendicitis is more common amongst miners than amongst others. The Director of the Native Affairs Department states that in July, 1915, there were 210,247 natives employed on the works and mines of the Rand; appendicitis is so rare that deaths from this cause are not classed separately; he holds that mine natives are not at all liable to the disease." The use of "French chalk" in dentifrices was another possibility, this material—magnesium silicate—being quite insoluble in the alimentary canal. The material was easily recognisable microscopically, but Professor Shattock had never found any in the appendicular contents or as forming the centre of a concretion. The use of Cerebos salt, which contains a notable amount of magnesium phosphate, could be ignored, since the latter was readily dissolved at 37° C. in a solution of HCl of the percentage in which the acid is present in human gastric secretion.

The hypothesis of most promise was that put forward by Mr. W. H. Battle—viz., that a new factor in the causation of appendicitis had been furnished by the particles detached from the steel rollers now almost universally used in grinding wheat for flour. After a lengthy investigation, Professor Shattock had somewhat reluctantly come to the conclusion that no proof of the theory was forthcoming. He had traced the fate of steel filings in flour, to which they had purposely been added, in bread made from such flour, and *in vitro* under the action of hydrochloric acid. Steel filings might be kept in flour indefinitely without undergoing oxidation. When flour containing such was made into bread (by means of yeast), the particles became slightly tarnished from an extremely superficial formation of ferric oxide (rust). When these particles were extracted from the loaf, and incubated at 37° C., in a solution of HCl of the gastric percentage, an abundant evolution of H took place. The fluid on being tested gave a *ferrous* (chloride) reaction only, without any *ferric*. (This was explained by the fact that any trace of *ferric* chloride produced from the minute amount of ferric oxide was reduced to ferrous in the presence of the free hydrogen. The point of this was that as *ferrous* chloride produced no constipating effects, no intestinal and appendicular stasis, favouring the formation of a concretion, could be attributed to the ingestion of steel particles—assuming this to take place. The amount

of solution which steel underwent in the acid within two hours, at 37° C., was small; the metallic particles would, therefore, pass with little change into the intestine, and here all further decomposition would be prevented by the action of the sodium carbonate of the pancreatic secretion, which rendered the intestinal contents alkaline. Steel filings might be kept for an indefinite period in a solution of sodium carbonate (of the percentage in which this is present in the pancreatic secretion) without undergoing any oxidation whatever. Mr. Battle had cited the pigmentation of the appendix which he had come across in certain cases furnished by operation, as suggestive of the prolonged ingestion of steel derived from flour. Professor Shattock had critically examined nearly all of these specimens, microscopically and microchemically, with the following result:—The colouration was due to the presence of somewhat translucent spherules of dull brownish colour contained in connective-tissue cells lying in the lymphatic tissue which surrounds the crypts; there was none in the muscular wall. When the sections were heated, *secundum artem*, in HCl and potassium ferro-cyanide or potassium ferri-cyanide no ferric or ferrous reaction was obtained in the spherules. When sections were freely treated with pure HCl no solution of the pigment took place. The pigment was clearly, therefore, iron free, and it followed from this that it could not possibly be iron or iron oxide that had reached the lumen of the appendix and been translated into its walls. The exact nature of the pigment was a more difficult question. In general characters it resembled iron-free blood pigment, and its presence was possibly due to the absorption of blood from the interior of the appendix. In cases of melæna Professor Shattock had on several occasions found blood in its lumen. Passing on to the study of a series of appendicular concretions, these were examined, after being incubated in dilute alcohol, by careful scraping whilst they were rotated beneath water, the whole procedure being conducted under a lens. The actual centre was examined microscopically *in toto* by removing it to a slide and washing it in Farrant's medium. In certain cases appendicular concretions formed upon a foreign body, such as a pin or fruit seed. The presence of a nucleus, however, was not only unnecessary, but in the great majority of cases there was none. The most careful examination *ad hoc* demonstrated that there was no differentiated centre whatever. The common appendicular concretion, as told microscopically, consisted solely of undigested plant débris. Cellulose was digested only in the large intestine, and by bacterial action alone. The débris referred to comprised free spirals, sclerenchymatous cells, the thick-walled, stiff, and sharply pointed hairs from the pericarp of the oat and wheat (abundant in oatmeal and flour), disintegrating wood and bast, &c. These consisted of lignine or cutine, and were incapable of digestion. Professor Shattock had found no cellulose in the concretions; this excluded the possibility that their formation resulted from a defective digestion of cellulose. The amount of calcareous deposition (calcium carbonate and calcium phosphate) occurring about the débris which formed the concretion was variable; in many examples it was of very limited extent, the concretions in the wet state being hardly firmer than clay. Such deposition was to be ascribed to bacterial action; the deposit, in fact, might not inappropriately be termed "appendicular tartar." He had not yet met with a proper appendicular calculus; the concretions consisted chiefly, or very largely, of vegetable débris, and the most accurate name for them was that of "stercolith." One factor that might conceivably lead to an increase in the formation of appendicular concretions, and so to an increase in appendicitis, was the recent rise of vegetarianism; a diet consisting almost solely of fruit and vegetable would furnish a greater abundance of indigestible residue. In some appendicular concretions there were conspicuous numbers of oat and wheat hairs; but Professor Shattock had not come across a concretion composed solely of such, and corresponding with the oat-hair concretions at times met with in the human colon. In the Museum of the Royal College of Surgeons of England there were several specimens of these curious formations, the first identified having occurred in a Lancashire carpenter, who was accustomed to take oatmeal daily in some or other form at every one of his meals. The augmentation of intestinal débris, it was true, did not, *per se*, make for the formation of a concretion; it was necessary to assume an appendicular stasis or some functional or organic irregularity of the appendix as a second factor; for under normal circumstances free ingress and egress took place from and to the colon. The different causes that led to stasis in the colon would bring about the same condition in the appendix; and, given a superabundance of indigestible residue, the latter would contribute a not unimportant factor to the origin of a concretion. In fact, there was no very abrupt line between concretions and scybala, and the actual centre of a laminar concretion was at times a small collection of minute scybala.

In regard to the results of the speaker's examination of the contents of 125 appendices from persons dying from other causes than appendicitis, the observations were made by pinning out the organ, slitting it up under water, and sweeping out the contents, which were then broken down with the brush, and carefully irrigated, any sedimentary residue being examined in Farrant's medium. For the present purpose it was enough to state that he had in no case discovered any particles of steel. He had selected for examination 100 appendices from individuals over 40 years of age, in order that ample time might have elapsed for the accumulation of metallic ingestion, and 25 from persons between 15 and 25 years, since this was the period of the highest incidence of appendicitis. Professor Shattock had encountered during these examinations two forms of neoplasm, for the presence of which the patients had not been admitted. In one case many small pedunculated adenomata projected from the mucosa, of the kind which at times grew in large numbers from the colon. In the other case the appendix was the seat of a typical columnar-celled carcinoma, which was in process of ulceration and had deeply invaded the muscular wall—an exact miniature of a carcinoma of the colon. The general conclusion at which Professor Shattock arrived, therefore, was that no evidence was forthcoming to show that appendicitis was due to damage inflicted on the mucosa by ingested physical irritants; and that the appendicular concretions often associated with acute inflammation were not attributable to an accumulation of inorganic material which might serve as a nucleus for the subsequent deposition of fæcal débris.

SECTION OF ANÆSTHETICS.

The Influence of Anæsthetics on the Temperature of the Body.—Exhibition of Apparatus.

THE annual general meeting of this section was held on April 14th, Dr. HAROLD LOW, the President, being in the chair.

A resolution was unanimously passed expressing the great loss the section had sustained by the death of Sir Frederic Hewitt, M.V.O.

Dr. M. S. PEMBREY and Dr. F. E. SHIPWAY communicated a paper entitled "Observations on the Influence of Anæsthetics on the Temperature of the Body." In this preliminary paper they did not refer in detail to the work of previous observers upon this subject. The influence of anæsthetics on the temperature might be exerted upon the loss of heat, the production of heat, or upon both of these processes. In man the practical methods of observation were the determination of the deep and surface temperatures, and as a measure of the production of heat the determination of the respiratory exchange. The former method they had used in man, and both methods had been employed by one of them in the case of animals. Deep anæsthesia abolished the regulation of both the loss and production of heat, so that the response of the warm-blooded animal to external heat and cold resembled that seen in cold-blooded animals; a fall of external temperature diminished, a rise increased the production of heat. It was this fact which complicated the problem. The internal temperature of a patient might show a fall, a rise, or no change according to the conditions involved during the period of anæsthesia. A fall in the rectal temperature from 100° to 97° F. was within physiological range when the whole extent of the daily variation in temperature was considered, but in the case of an anæsthetised patient subjected to an operation in a warm theatre (72°–74° F.) such a fall might occur within one hour. During short operations of slight severity the necessity for precautions against the loss of heat was not urgent, for in an adult there was, owing to the mass of the body, a reserve of heat which was not rapidly dissipated in a hot theatre. In such cases the advantages of warm

ether as compared with cold ether might not be so apparent. On the other hand, in the case of long operations or operation upon a patient possessing a low resistance the difference might be of great practical importance. The "open method" of giving ether used in these observations was that in which ether was dropped continuously on to some fabric spread over a Schimmelbusch mask, which was so closely applied to the face that the whole of the respiratory current passed through the fabric; when warm anæsthetic vapours were given the end of the tube from Dr. Shipway's apparatus was placed under the mask and warm ether vapour was pumped in at each inspiration. Either two layers of domette or 10–16 layers of gauze were used. With this method the temperature under the mask varied from 48·2° to 78·8° F. with cold ether, whereas with warm ether it was about 90° F. A patient breathed about 5 litres of air per minute, and the expired air was raised to 96° F. or thereabouts. It was obvious, therefore, that more heat must be lost from the respiratory tract, although the expired air with cold ether might not be warmed to the same extent. With such an "open method" they had never observed a lower temperature in the inspired air under the mask than 48·2° F., the temperature of the air of the theatre being 77° F., and some explanation was necessary for the exceedingly low temperatures recorded by some observers. It was necessary to remember that the air in the mask was being warmed constantly by the skin of the face and every few seconds by the expired air. For example, with a Schimmelbusch mask, two layers of domette, and a pad placed over the face the temperature of the air was 91·4° to 93·2° F. five minutes after the mask had been placed over the face, the temperature of the room being 71·6° to 73·4° F. The mask and pad were removed from the face and ether dropped upon the domette as during an administration, the temperature of the air fell to 32° F.; they were immediately placed over the face and within one minute the temperature of the air rose to 61·7° F. As regards the temperature of the body, observations of the rectal temperature were necessary, for the determinations in the mouth were unreliable. The surface temperature of the skin might rise under the influence of ether, owing to dilatation of the cutaneous vessels, and thus increase the loss of heat so much that the internal temperature fell. With warm ether the loss of heat from the skin could be more readily compensated. The excitability of the medulla was increased by a rise, diminished by a fall, in the internal temperature; this effect upon the respiratory centre was well known, and in a pronounced form was seen in heat polypnœa or dyspnœa. The heart was stimulated by warmth and the exchange of the gases between the blood and the tissues was facilitated by a rise, delayed by a fall, in temperature. A normal man reacted to external cold by diminishing his loss and increasing his production of heat; the anæsthetised man, paralysed for sensation and movement, had lost this control, and the level of the chemical changes which were a measure of vital activity could be maintained only by external warmth. This loss of control involved also the possibility of an abnormal rise in the temperature of the patient if he were exposed to excessive heat. A great practical advantage of warm vapours was that they enabled the surgeon to operate in a cooler theatre; high temperatures had a depressing effect on the staff. Apart from diminished efficiency and endurance, a warm and moist atmosphere introduced the danger of the sweat of the surgeon undoing the elaborate precautions taken to preserve aseptic conditions. The "open method" was not strictly an open one. The mask placed upon a pad over the face confined the air to a considerable extent; this was shown by the determinations of the moisture and the carbon dioxide in the air space. Thus the dry and wet bulb thermometers recorded 88·7° and 86° F. under the mask, and waved in the air of the room 72·5° and 65·3° F. The breath moistened the air, and thus obviated the necessity of adding moisture to the air laden with ether vapour. The amount of carbon dioxide might be 3 or 4 per cent. of the total 250 c.c. of air under the mask; there was, according to the closeness with which the mask was applied to the face and the thickness of the material, a certain amount of rebreathing, which might be an advantage when the stimulating effect of carbon dioxide was required.

Dr. SHIPWAY said he had used warm vapour anæsthesia for 18 months and had published a description of the method, its advantages, and of an apparatus in THE LANCET of Jan. 8th, 1916. One part of the evidence for the use of warm vapours had been given in the joint paper just read; the other part was due principally to some American anæsthetists who had shown by experiments on animals and by clinical observations that warm vapours were safer and diminished the loss of heat of the anæsthetised patient. He himself had found that the anæsthetic could be pushed with greater safety and with lessened liability for respiration to become dangerously weak; the reason was physiological, in that in the anæsthetised patient warmth increased respiratory activity and stimulated the heart. Induction was quicker and calmer and respiration was quieter since warm vapours were more easily absorbed and less irritating than cold. Shock was certainly less; his results had been better than with "open ether." An apparatus was then shown by means of which the warm vapours of ether, chloroform, or of mixtures of the two could be given in concentrations adequate for any operation. Other advantages had been already described.

Mr. C. CARTER BRAINE did not advocate "open ether"; he employed the "closed method," working either with the Clover or Ormsby inhaler. He thought the pioneers of ether administration in this country had endeavoured to employ warm ether vapour by the method of rebreathing, by warming the inhaler prior to use, or by warming the sponge of the Ormsby inhaler. He had returned to the use of the Clover of late in place of the Ormsby, and found it an excellent machine in conjunction with morphine and atropine. In order to render the administration of a slightly open ether type he had fixed a tap at the lowest part of the bag, by means of which air could be admitted and some of the contents of the bag expelled during expiration. A certain amount of rebreathing was beneficial, and the very satisfactory results obtained he attributed to the patient breathing a warm atmosphere with conservation of his CO_2.

Mr. G. ROWELL said that in two cases of warm ether anæsthesia symptoms of faintness gradually arose which appeared to be directly associated with the very warm vapour administered. He preferred many layers of gauze to two layers of domette, which offered much more obstruction to the breathing. He still employed the Clover on occasion; most of the advantages of the open method could be gained by using the Clover nearly all the time without the bag.

Mr. H. BELLAMY GARDNER was glad to hear that it was only necessary to warm the patient by means of a warm table and dry cloths, and perhaps preventing the fall of temperature in the vapours inhaled by artificial means, instead of by raising the temperature of the theatre and thereby exhausting the patient and those taking part in the operation.

Dr. G. A. H. BARTON was not convinced by the evidence offered of the value of the warmed-ether method.

The PRESIDENT said that the question of loss of heat during anæsthesia was a very vital one, especially since we were told that in the narcotic state man became a cold-blooded animal and lost for the time being much of his normal power of readjustment of his temperature. The warm-ether method was therefore to be preferred to that of the open-ether method, where the ether was allowed to evaporate on the mask and in its evaporation to abstract heat from the patient. The discussion had narrowed itself too much into a controversy between the Clover and the open-ether method. Successful anæsthesia depended more upon the administrator than upon the apparatus.

Dr. SHIPWAY, in replying, said that the pioneer anæsthetists warmed the inhaler in order to aid the administrator and not in order to help the patient. He had never seen faintness or pallor due to the use of warm vapours; they must be used with judgment, very high temperatures caused sweating, flushing, and oozing in the wound.

The PRESIDENT showed an apparatus for the intratracheal insufflation of ether, designed by Mr. K. H. McMillan, of St. Thomas's Hospital, and Dr. SHIPWAY showed an apparatus of new design.

Captain C. T. W. HIRSCH, R.A.M.C., showed a modification of Waller's chloroform inhaler (see p. 1003).

WEST OF ENGLAND CENTENARIANS.—Mrs. Ann Moore, of Torrington-place, Plymouth, died last week. She celebrated the 105th anniversary of her birthday on Jan. 20th. —Mrs. Mary Shittler, of Buckshaw Farm, near Sherborne, Dorset, recently celebrated the 102nd anniversary of her birthday.

Reviews and Notices of Books.

Tuberculosis: A General Account of the Disease, its Forms, Treatment, and Prevention.

By A. J. JEX-BLAKE, M.D.Oxon., F.R.C.P.Lond. London: G. Bell and Sons, Limited. 1915. Pp. 231. Price 2*s.* 6*d.*

THE author describes his book as an attempt to give a general and detailed account of tuberculosis in simple language. He has endeavoured to avoid as far as possible the use of technical and medical terms with the hope of making the work intelligible to those who have had no special education in medical or scientific matters. In these aims he has been conspicuously successful without the sacrifice of either clearness or accuracy. He has furnished an attractive and, at the same time, well-balanced account of the whole subject. The matter is treated in 15 chapters, each preceded by a table of contents and conveniently furnished with inset headings. The first is historical, briefly summarising the views of Hippocrates and Galen down to those of Virchow and Koch. Chapters on the tubercle bacillus and the tubercle follow, and then what we find to be a most illuminating chapter on Predisposition and Immunity of Tuberculosis. It is only unfortunate that a very disturbing misprint of "infection" for "hereditary" should occur on p. 40, line 18; otherwise the book is singularly free from errors of any kind. A series of chapters follow on clinical aspects of the disease, ending with three chapters on general, tuberculin, and sanatorium treatment. Here, again, we cannot imagine a fairer distribution of the claims for treatment, and the author appears to have no axe of his own to grind. The final chapter deals with prevention from the three points of view of destruction of the tubercle bacillus, avoidance of infection, and care for the general health of the community. The reader who makes this book his introduction to the study of tuberculosis will obtain a useful view of the subject in proper perspective.

Occupations from the Social, Hygienic, and Medical Points of View.

By Sir THOMAS OLIVER, M.A., M.D. Glasg., LL.D., Sc.D., F.R.C.P. Lond. Cambridge Public Health Series. At the University Press. 1916. Pp. 110. Price 6*s.* net.

THE need for further study of the conditions under which workmen are employed has been shown by recent Home Office inquiries into the question of fatigue as affecting the printing and chemical trades, coal-mining, and the health of the munition workers,[1] and these inquiries will probably be extended in the future—we shall have to deal with the industries of maimed soldiers, for instance, while the employment of women will have to be considered in its relationship to the health of future generations and the preservation of child life. For these reasons a guide to the study of occupations from the social, hygienic, and medical points of view, written in a style which can be easily understood and which will appeal to all those who are interested, whether practically or academically, in the health of the nation's workers, is very desirable at the present moment. Such a guide, not addressed to medical men alone, has been written by one who, in addition to being professor of the principles and practice of medicine at the University of Durham, has had a wide experience in the investigation of industrial disease, for Sir Thomas Oliver has been employed by the Home Office as an expert on special committees and inquiries into dangerous trades, on potteries and lucifer matches, and he was also a member of H.M. White Lead Commission.

In a book of this size a full exposition of a very large subject cannot, of course, be given, but the many-headed theme is dealt with in a thoroughly scientific, if brief, manner. The air of town and country, the relation of indoor and outdoor work, wages, efficiency and fatigue, the health and comfort of the workers, and generally the influence of harmful trades on man and his surroundings, are clearly discussed, and a bibliography at the end of each chapter indicates to the reader where he will be able to find fuller information. A question of very vital interest in the times that are before us is the choice of a career for boys and girls, and in one chapter we have the pros and cons of the various forms of employment for the two sexes in regard to health briefly weighed. A short introduction passes in review the origin and rise of commerce and manufacture and the interposition of the State in regard to the persons employed in manufacture and industry.

We welcome this book as a valuable introduction to the study of subjects which must grow in importance as trade and commerce increase, for the health of the worker and the increase of population are among the things upon which the stability of the Empire is based.

[1] THE LANCET, Oct. 2nd, 1915, p. 765, and April 8th, 1916, p. 785.

The Rat: Reference Tables and Data for the Albino Rat and the Norway Rat.

Compiled and edited by HENRY H. DONALDSON. Memoirs of the Wistar Institute of Anatomy and Biology, No. 6. Philadelphia. 1915. Pp. 278.

THE rat has many claims upon the attention of the medical man, since at several points its life-history is interwoven with the problems of human welfare and human disease. To the rat probably belongs the distinction of being the greatest mammalian scourge with which man has been called upon to deal; its presence is a constant economic problem, potent to waste merchandise and to disseminate disease. Science has had its revenge upon the rat, for not only has it evolved wholesale methods for its destruction, but it has made it one of the most useful laboratory animals. The rat may be regarded almost as a standard experimental animal in many methods of medical research. It is from this point of view that Professor Donaldson and his associates at the Wistar Institute have for many years made an exhaustive study of the rat. The work is divided into three parts: the first gives a short but excellent account of the zoological position and the historical migrations of the Norway rat; the second deals exhaustively with the domesticated white rat; and the third with its wild pigmented relatives. The statistical tables will be of the greatest value to the laboratory worker. Among the findings that are of the most general biological interest are the marked differences determined between the relative weights of the various viscera in domesticated white rats and their wild relations. The brain and spinal cord, the suprarenal, and the genital glands of the wild rat are relatively heavier than are those of the laboratory animal; the reverse is found in the case of the hypophysis cerebri, while the thyroid shows no variation. A striking section of the book deals with the activity of the animal, for, working with recording wheeled cages, Slonaker has determined that one rat ran a distance of 5447 miles in its active life-span of 33 months; it is also interesting to note that living in revolving cages, which permit of exercise, shortens the life of the animal. The full bibliography includes some 900 works dealing with aspects of the life-history of the rat.

New Inventions.

APPARATUS FOR CHLOROFORM ANÆSTHESIA IN MILITARY PRACTICE.

THE chloroform apparatus that I now recommend especially for military use is a modification of that shown by Professor Reynier in the Physiological Laboratory, University of London, at the meeting of the Section of Anæsthetics of the International Congress of Medicine, 1913. The apparatus is designed in conformity with the principles laid down by Snow and by Paul Bert, that for its safe administration chloroform vapour must be delivered at regular and easily controlled percentage. The French instrument is graduated on the system of Paul Bert and delivers nominally 0·4 to 1·2 grammes of liquid chloroform per 100 litres of air—corresponding with approximately 0·8 to 2·4 per cent. of chloroform vapour in air. The different strengths of mixture are obtained by varying the relation between two orifices, one large and invariable through which air is inspired, the other small and variable through which strong chloroform vapour is drawn into the main air stream. The variation of percentage is effected by varying the size of this second inlet by means of a revolving tap, which acts like the throttle of an ordinary petrol engine. The percentage is varied by opening and shutting the throttle; anæsthesia is, in fact, maintained of required degree, much as a petrol car is kept going at required speed by opening and shutting the

throttle. The apparatus acts like a carburetter, affording to respiration a more or less rich mixture of chloroform vapour plus air. The model shown by Professor Reynier has presented, in my experience and in that of Dr. J. Blomfield, certain advantages and disadvantages. The principal advantages are that the apparatus is portable and that both inspiration and expiration draw chloroform vapour from the chloroform chamber, so that there is no re-breathing. The principal disadvantage of the French model consists in the wholly illusory character of the graduation. Used precisely as described by Professor Reynier, the percentage of chloroform delivered has always been considerably below that indicated by the graduation of the instrument. And in correspondence with this fact it is insufficient to anæsthetise in cases requiring more than average strength of chloroform vapour, as happens habitually in military practice. I do not think it safe to attempt to increase the delivery of chloroform vapour by the application of hot cloths round the apparatus, as recommended by Professor Reynier; the percentage is then considerably above that indicated on the scale.

I found it necessary to modify the dimensions of the apparatus so as to obtain at ordinary room temperature (65°–70° F.) from 1 to 3 and 3·5 per cent. of vapour as measured by the densimeter, and I employed, as an evaporation fabric, lamp-wick, of which I had had satisfactory experience in an apparatus I devised some years ago and described under the name of the wick-vaporiser.[1] I spent a considerable amount of time upon the graduation of the modified apparatus at different temperatures and came finally to the conclusion that in consequence of what I may term its self-regulating character no great fluctuation of percentage occurs with fluctuation of temperature in the practical use of the apparatus. Self-regulation occurs in this wise. Where the apparatus is applied to the patient's face the temperature of the apparatus is raised by the expired air and cooled by chloroform evaporation. At 2 per cent. of chloroform vapour the warming by expired air and the cooling by chloroform evaporation balance each other, and the apparatus remains at constant temperature. If respiration becomes less vigorous, less warming by expiration and less cooling by evaporation takes place, and vice versa with more vigorous respiration greater warming by expired air is counterbalanced by greater evaporation of chloroform, so that under all conditions there is a tendency towards a prompt return to the average value of chloroform evaporation that balances warming by expiration. And by a fortunate accident the latent heat of vaporisation of chloroform and the specific heat of air are such that this point of equilibrium happens to be at the value of 2 per cent. At this percentage the self-regulation is complete; at higher and lower percentages it is no doubt less complete, but nevertheless practically efficient; with the index at, e.g., 3 per cent. the tendency is towards lowering of temperature and lowering of percentage; with index at, e.g., 1 per cent. the tendency is towards increased temperature by expired air and rise of percentage—i.e., in both cases towards the equilibrium point. I regard this self-regulating property of the apparatus as being of considerable advantage in the maintenance of uniform anæsthesia. I attach less importance to the observation of the nominal percentage during administration than to the state of the patient, according to which the throttle is opened or closed. It is, of course, valuable to realise the numerical value of such variations, but it should also be realised that any defective adaptation of the face-piece entails a reduction of the real below the indicated percentage. I have on previous occasions, and especially at a time when it was most necessary to insist upon the danger of overdose, given as the normal range 1 to 2 per cent.[2] I now think it to be necessary in exceptional cases, and as a rule in the class of cases with which we have to deal in military practice, to regard 3 per cent. as the upper limit.

The following is a description of the modified apparatus: The hand (of the patient in this figure) is upon the throttle valve, of which the port, P, is increased or diminished by turning the milled head M. A partition, S, separates the chloroform chamber $CHCl_3$ from the rest of the apparatus. The patient inspires air through the principal air tube A, plus more or less chloroform vapour through the lateral tube B, which leads the chloroform chamber to the air tube according as the throttle is opened or closed at the port P. The chloroform chamber is lined with lamp-wick and is charged by pouring in about one fluid ounce of chloroform, the lid of the apparatus being removed for this purpose. A charge lasts about half an hour. The apparatus may be

applied to the patient by an orderly or nurse. It can be held on the face and manipulated by the patient himself for the induction of light anæsthesia.

The apparatus has been in use at the Royal Herbert Hospital, Woolwich, during the past year in over 2000 cases.

Professor Reynier's original model of the apparatus and my modification of it offer in the hands of certain administrators a disadvantage that Captain C. T. W Hirsch, R.A.M.C., has endeavoured to overcome. The good adaptation of the indiarubber margin of the face-piece is sometimes difficult to secure in all positions of the head. Captain Hirsch has separated the two parts of the apparatus—i.e., the chloroform chamber and the actual mask.[3] The junction between these two parts is effected by a broad gauge tube at an angle of about 120° that can be rotated so that the chloroform chamber itself is always brought into the vertical position. By this device the risk of spilling the chloroform is avoided and different face-pieces can be adapted to different shaped faces.

A. D. WALLER, M.D., F.R.S.
Physiological Laboratory, University of London, South Kensington.

[1] A new apparatus for the delivery of chloroform and air of suitable and easily governed strength, Transactions of the Royal Medical and Chirurgical Society, vol. lxxxviii., 1906, p. 15.

[2] On the Dosage of Chloroform, Brit. Med. Jour., April 23rd, 1898.

A NEW INSTRUMENT FOR INTRAVENOUS INJECTIONS.

THE illustration shows a combined needleholder with two-way tap which I have devised for intravenous injections, and which I have found most useful in the treatment of syphilis. The instrument can be manipulated with one hand and the operator has control over the flow of the fluid in both containers. The saline solution or the anti-syphilitic fluid can be instantly turned on or off at will. The tap is closed when the wings are at right angles as in the illustration; a turn to the left opens the left tube,

and a turn to the right opens the right tube. The wings also serve to give the operator a firm grip on the instrument when inserting the needle. It will be seen that this simple contrivance does away with the taps or clips which are usually fixed to the tubing and which require the services of an assistant. The nozzle of the needleholder has a slight crank bend which brings the needle into the plane of the under surface and in line with the vein.

The Holborn Surgical Instrument Company, Limited, are the makers of the instrument.

HAROLD SPENCE, M.D., C.M.

[3] THE LANCET, April 1st, 1916.

THE LANCET.

LONDON: SATURDAY, MAY 13, 1916.

The Supply of Medical Officers to the Services.

WE published last week a letter signed by Sir CLIFFORD ALLBUTT and Sir WILLIAM OSLER laying stress on the probable need for further medical officers in the navy and army, and pointing out that a wide adoption of the system of voluntary enrolment would lead to a fair adjustment of military service among members of the medical profession. As we have said in these columns on many occasions, under a system of voluntary enrolment the medical profession recruits or conscripts its own members, judges their suitability for commissions, and makes arrangements by which the persons selected for commissions are those who can best be spared by the civil community. Only medical men can fully appreciate the difficulties that lie about the path of one practitioner more than of another; only they can sum up the arguments for and against a particular medical man receiving a commission in the navy or the army; and only instructed medical opinion can fairly decide, as between individuals, who is the particular man whose absence from home will least disturb the medical service of any given locality. For these reasons we sincerely hope that during the short time which it can be expected to remain on trial the system of voluntary enrolment will prove successful.

At a meeting of the Central Medical War Committee last week the position of the medical profession under the new arrangements for compulsory military service was closely considered. All citizens, including medical men, between the ages of 18 and 41 are now required to serve, and this fact should strengthen the position of the Central Medical War Committee, seeing that if medical men under 41 do not ask for medical commissions they can be requisitioned as privates. The effect of this may be valuable. A pledge was given, it will be remembered, by the Central Medical War Committee that medical men who enrol would not be called up until 75 per cent. of the possible constituency had enrolled. But before the number of the enrolled had reached 75 per cent. of those presumably available—the exact figure is obviously most difficult to ascertain—the War Office asked for more medical officers, and there must be difficulty about the keeping of the pledge unless the covenant is met by the voluntary enrolment of medical men of military age, that is of under 41 years, who might otherwise be wasted as privates. These men may possibly make up among them, with the large number already enrolled, 75 per cent. of all the medical men up to 45 years of age. So far the Bill should assist the Central Medical War Committee, but there is another side to its influence. The Local Tribunals can absolve a medical man from military service, and we view this situation with some apprehension. Medical men of military age not desiring to serve would certainly meet at the hands of the Tribunals with every consideration, if a claim for exemption were brought forward based upon a desire to discharge medical duties in the district and upon an apprehension lest the local civil community were being deprived of necessary medical service. But the Tribunals will not be in a position to come to well-informed decisions. We feel that if the necessary number of men for the military forces is to be obtained with the least hardship to the civil population, medical men should be enrolled under the authority of a statutory committee rather than be compelled to go before the Local Tribunals. We hope that it is not yet too late for the Government to take this view, but we are quite aware that it has not been received favourably.

Of course, the Government may not be willing to recognise the Central Medical War Committee as so adroit a body as to be able to act both as a recruiting agent and as a local tribunal. Yet this is the method by which the right officers for both the navy and army could be obtained, and the Central Medical War Committee would be quite justified in taking the responsibility of the position, reinforced as it is by a strong reference committee appointed by the Royal College of Physicians of London and the Royal College of Surgeons of England. This reference committee, though added to the body especially to consider the position of the medical staffs of the metropolitan hospitals, was definitely appointed to assist generally with authority and advice in all the work of the committee, and in this way the Central Medical War Committee derives authority and prestige from the ancient corporations, and a position from which to seek recognition as a statutory committee. We must all recognise the absolute waste implied in using qualified medical men as privates in the trenches. As a matter of fact, we cannot believe in the qualified doctor who prefers to be a private, and as far as the medical profession is concerned the Military Service Bill may be considered to be a sort of conscription of officers rather than of privates, for every medical man under 41, being conscripted, will ask for a commission in the Royal Army Medical Corps. When this position is reached the Central Medical War Committee might well have very valuable work before it, for it is the only body which can select the medical officers of the navy and army fairly and without any local bias. Its work depends on that of local committees so that it can deal justly between individual medical men and between the medical profession and the public. If the Government gives the statutory position to the Committee, its personnel could be strengthened in any way that was desired by nominees knowing their business. We quite appreciate the reluctance that there will be to set up a special sort of tribunal for one class of the community, but it must be remembered that medical men are distinguished from other sections of the public in this respect, they are

ready made for the army. They are wanted as medical men, and as medical men they are in the best position to know which of their body should be taken, and which should be left.

The Medical Examination of Recruits.

THE provision in the new Military Service Bill for the medical re-examination of rejected men has again called attention to the circumstances under which recruits are examined to ascertain whether they are medically fit to be trained for military service. From the beginning of the war there has been a constant call for more men to join the army, and at times the pressure on the doctors who were charged with the duties of examining them was extremely severe. Experience has shown that during the great rushes to the colours the medical examinations were in many cases hasty; this was inevitable, but too many men were passed who subsequently proved totally unfit for the purposes required. Many of these broke down soon after enlistment, were sent to military hospitals, and were then discharged to depôts for duty, only to drift back to the hospitals again. They thus became a source of considerable expense to the country, and attempts to make soldiers of them utterly failed. A large number of these men had such physical disabilities that they ought never to have been admitted. Some, it is to be feared, exaggerated or feigned their symptoms, so that they might enjoy a quiet time in the hospitals, whilst others were genuinely anxious to continue in the service, and were perfectly willing to undergo operations for varicose veins, hammer-toe, and so on, in order that they might play their part as patriotic citizens. In dealing with men sent into the military hospitals, especially those who have had under six months' service, it is often particularly difficult to distinguish between those who are actually suffering from a disability which would render them unfit for further military service and those who are malingering; the former, of course, should be discharged on medical certificate, whilst the latter should be sent back to duty. The differential diagnosis, however, often puzzles the most experienced physicians and surgeons. Whilst during these times of pressure unfit men may have been accepted, a certain number of perfectly fit men were probably rejected, and thus the numbers admitted may have been in a certain sense adjusted, but the economic difference has been immense. Further, some men may have been rejected on account of conditions then existent which have since been cured, just as other men, perfectly sound on enlistment, have developed disease which would necessitate their discharge. On these grounds (with a proviso presently to be mentioned) we think that the decision for re-examination is justified.

For a medical test to be satisfactory it must be thorough, and it is obviously false economy to appoint too few medical men for the purpose, or to press them with too many recruits in a single day, for as we all know, men hastily examined have given rise to great expense, which, with better organisation, might have been avoided. Candidates for admission to Woolwich and Sandhurst have to pass through a rigid medical examination, and in order to secure men healthy and strong in every way, a similar plan should be adopted for those intended for the rank and file. Needless to say, after the eyesight has been found to be up to the standard, each man should be stripped so that the chest can be satisfactorily examined, and such disabilities as hernia, varicose veins, and flat feet may not escape notice. Some deviations from the healthy standard may be difficult to assess, such as certain physical signs in the chest which may not necessarily be of serious import, or a varicocele which is not sufficient to interfere with military training; to deal with such instances there should be an appeal board composed of experienced physicians, surgeons, or specialists, who would give a final opinion. The absence of some such advising and correlating authorities, coupled with avoidable muddling, has led to a margin of error in the passing of recruits, which has been considerable. The unsatisfactory character of some of the examinations has been duly recognised, and since Jan. 20th of this year an improved system has been instituted by the War Office. Recruiting boards were then set up under the control of men specially chosen and approved, and as far as our information goes distinct improvement has taken place. For this reason we consider that the proposed re-examination should only apply to those men who had been examined previously to Jan. 20th of this year, this being the proviso referred to above. We would also urge that the medical men who are deputed to carry out such re-examinations should be those who have had especial experience as physicians and surgeons, for many of the cases to be reported upon must present problems not altogether easy to solve, and consultations between the examiners would naturally be of considerable advantage.

So far we have had in mind only the examination of recruits for general service. Men who are found unfit for duty overseas may be considered fit for field service at home or garrison duty at home or abroad, or in a purely sedentary occupation or in a labour section. The standard required for general service would not be required for home service or for office work, especially in regard to vision, but nevertheless it would be false economy to admit men with a disability which would be likely, under stress of work, to place them on the sick-list. We would strongly urge the imprudence of lowering the line here too far. There are many men invalided from the front who are perfectly capable of undertaking duty in home service, while it will probably be found that many individuals who are unfit for general service, or for field service at home, will be of more value to the community if retained undisturbed in civil life. It is the disturbance of routine that so often proves fatally trying to the subject of impaired physique.

Annotations.

"Ne quid nimis."

THE LONDON WATER-SUPPLY: A YEAR'S WORK SUMMARISED.

ATTACHED to the report recently issued on the condition of the Metropolitan water-supply during the month of December, 1915, is an appendix by Dr. A. C. Houston, the director of water examinations, summarising the results of the chemical and bacteriological examinations of the London waters for the 12 months ended Dec. 31st, 1915. The importance of storage is again confirmed, while there is recorded the striking fact, shown in past reports, that London is not drinking merely filtered raw river water, but raw river water which by storage processes has been purified bacteriologically antecedent to filtration, and this to a remarkable extent. But, as Dr. Houston points out, implicit belief in the value of storage does not imply that the quality of water taken into store is a matter of no importance, otherwise the idea might well be entertained that the purification of sewage in a given watershed was of no consequence. The aim of a water authority must still be to choose water for storage purposes in as pure a condition as is practicable, and the protection from risk of water-borne epidemic disease conferred by storage must never be regarded as more than relative and supplementary. About 80 per cent. of the London water-supply is derived from rivers either directly or indirectly polluted with sewage, but Dr. Houston says that within recent years a marked improvement has taken place in the methods of purifying sewage so as to render the resulting effluents non-putrescible and chemically unobjectionable. Apart from sterilisation, however, no practical process has yet been found which turns out a "safe" effluent, *bacteriologically*, and the great majority even of chemically-satisfactory effluents are, Dr. Houston says, swarming with excremental bacteria. It is possible that improved methods of purification will, from a chemical standpoint, keep pace with increasing pollutions of the Thames and Lee, but the outlook bacteriologically is, according to Dr. Houston, less hopeful. The raw waters of the Thames and Lee contain B. coli in undesirable numbers, but fæcal streptococci are seldom discoverable in one cubic centimetre of the water; and if pathogenic microbes are present at all their numbers must be so small that it is hardly conceivable that any of them could survive passage through the storage reservoirs and reach the filter-beds, which in their turn remove about 98 per cent. of bacteria of all sorts. Storage, moreover, gives trouble in one odd direction—algæ develop occasionally, and the occurrence leads to difficulties of filtration and to unpleasant taste and smell in the water. Apparently no preventive measures can with any confidence be suggested to meet this nuisance, but as the conditions favouring the growth of the algæ are better understood means may be found of preventing or retarding their development. In February, 1915, the West Middlesex water developed the fishy odour which had been prominent in this supply in the year 1912–13, and there was much alarm occasioned amongst the consumers supplied from this source. The cause was traced to the growth of Tabellaria in the West Middlesex reservoirs. The algal taste was successfully overcome by the addition of potassium permanganate in the proportion of 5 lb. per million gallons of water. It is curious that chlorine preparations, as for example, bleaching powder, were either useless for the purpose or were not equal to the efficient action of the permanganate. The incident was reported in our columns, and affords good reason for believing that with increasing knowledge the water authorities will be able to deal successfully with what at present is a serious if infrequent source of annoyance to the public. Accidents will happen in spite of all the refinements of precaution in regard to storage and filtration, and when they do they generally destroy all the good work of purification that has been done. Constant vigilance is needed in connexion with questions of drainage, health of workmen, suction of impure water into water mains, repairs of mains, and so forth, in order that the water purified with such care may be guarded against any possible source of subsequent infection. But the sum of Dr. Houston's findings appears to be that the evil potentialities of an impure source can be largely, if not entirely, annulled by adequate storage and filtration. An initially pure source is vastly preferable, but sometimes impossible to obtain. There are risks of a breakdown in the London system, but so far the policy of storage and filtration has preserved a pure supply of water for metropolitan needs from river sources. And it has saved London from the immense undertaking and expense which would be incurred by seeking elsewhere for purer sources of supply, as, for instance, from an adequate watershed situated as far off as Wales.

CRIMEAN MEMORIES.

"IT is curious at the present time to dip into old volumes of THE LANCET and to compare the state of military hygiene as it affected surgeons in the Crimean campaign with that of the great war now raging." Thus writes a correspondent. The miserable state of our ambulance and hospital system in 1854–56 has long been proverbial. "Our surgeons are treading on infernal machines before Sebastopol," says a review of a work on the Ambulance System in THE LANCET of July 7th, 1855, "contending against cholera and the poisonous exhalations of Perokop, fifty-four surgeons and our so-called sanitary officers in the Crimea being dead." Obituary notices of deaths of army surgeons occur in every number of the medical journals of the Crimean epoch. They seem all to bear witness to mismanagement on the part of the authorities and to heroism on the part of the dead. Between the middle of September, 1854, when the Allied troops landed in the Crimea, to July, 1856, when they evacuated it, the list is formidable enough. A Mr. Read, staff-surgeon in charge of the medical stores at Scutari, dies from cholera on Nov. 28th, 1854. William A. Anderson, surgeon 41st Regiment, dies from typhus on board ship in the harbour of Balaclava (Jan. 3rd, 1855). On Jan. 20th Alexander Struthers, M.D., a young man of great promise in his profession, and brother of the famous lecturer on anatomy, dies from fever at Scutari. He had been overworked while attached to the barrack hospital. It was overcrowded with fever patients, and he contracted the infection on Christmas Day, recovered, and relapsed. Dr. Wason, one of those who attended him, died on

Feb. 7th, and they lie buried on a height overlooking the Sea of Marmora. John Newton, second-class staff-surgeon, dies also at Scutari on Jan. 26th, as does Frederick A. Macartney on Feb. 12th. On Feb. 8th we read of the death from fever at Balaclava of Francis Smith, surgeon to the 95th. At the end of the month the sanitary state of the army at Sebastopol is described as improving, but typhus and typhoid are still raging at Scutari and Balaclava. A vast mass of putrefying matters are still said to be lying about the camp at Sebastopol. The climate is described as most capricious, alternating between heat and cold, with piercing north winds at night which were very trying to the soldiers. At the same period we read of mismanagement in the matter of transport of the wounded. Ambulances are tried which are swung on vulcanised indiarubber springs, but prove to possess an uncomfortable jogging motion. There is, at a later period, an account of the trial of a knapsack invented by Berington, which is found not to drag on the armpits as does the army knapsack of the time. It had not yet been adopted in the army, and THE LANCET remarks: "We should have thought that by this time the shortcomings of all the arrangements in force with respect to the equipments of our troops and their influence for good or evil on the health of the army ought to have been perceived, and the remedies applied where found to be necessary." On Feb. 16th, 1855, John Grabham, assistant surgeon, 71st Regiment of Foot, dies, aged 24, at Scutari, from malignant fever contracted in the zealous discharge of his duties at the General Hospital. Dr. Lamont dies from fever before Sebastopol, aged 22, in January. In March, Edward Leblanc, surgeon of the 9th Regiment, is shot dead accidentally by a French sentry. On April 4th Ludlow Harvey, aged 29, dies at the British Hospital, Scutari. He was acting assistant staff-surgeon at the time of his death, and had been most honourably mentioned for efficiency in charge of the sick and wounded on board the steamer *Trent*. He was surgeon to the Royal Free Hospital and a medical journalist. On April 21st Dr. Hector Gavin is accidentally shot by his brother when in their tent before Balaclava and dies after great agony. He is described as a man of indomitable perseverance and energy. Other names of surgeons who died in the performance of their duty in the Crimea or at Scutari are Robert Thomas Simons (April 28th), Alexander Wishert (May 25th), Dr. Walter Simpson (June 3rd), Dr. Ninian Hill (June 22nd), Roy Samuel Millard (June 9th), Lawrence Ormerod (June 20th), A. Sibbald (June 26th), John Horsley White (July 3rd), John Longmore (August 22nd), Edward John Complin (Oct. 29th). Fever is in almost all cases the cause of death; none fell as now, before the bullets of the enemy. In October, just before the last-recorded death of a surgeon in 1855, THE LANCET heads a vigorous leading article "Mr. Bracebridge's Abuse of Crimean Doctors." He had been to the front and lectured in Coventry on his return to England on what he deemed the inhumanity and backwardness of the English army surgeons. He compared them unfavourably with the French surgeons, who were then held, with the Austrians, to be in the van of military surgery. THE LANCET writes of Mr. Bracebridge in a way that would to-day be highly dangerous, though every syllable and insinuation were true. Clearly the exposure was merited, for it is not possible to find any recorded cases of callousness on the part of army surgeons at that time save one. The accused in this case was court-martialled for neglect of the wounded and was condemned to a term of imprisonment. Before the close of 1855 we read that he had died in confinement and that he was insane.

THE SECRETION AND EXCRETION OF SALVARSAN AND NEOSALVARSAN.

IN an interesting paper read before the Society of Public Analysts at a meeting held on May 3rd Mr. John Webster, F.I.C., presented the results of some analyses showing the relative amounts of arsenic found in the various organs after injections of salvarsan and neosalvarsan. Special attention was drawn to the relatively very high proportion of arsenic present in the kidneys. In one case a post-mortem examination had shown that nephritis was present. Various analyses of urine were made showing the variability of the rate of excretion. Analyses of human milk from two cases of salvarsan treatment were referred to and the results indicated that after a dose or repeated doses of salvarsan the milk of a lactating woman is entirely, or almost entirely, free from arsenic. A minute trace of arsenic was found in one specimen only. Mr. Webster expresses the opinion that any beneficial results to the syphilitic child fed on such milk cannot be due to the presence of salvarsan or other compound of arsenic present in the milk of the mother.

THE INFLUENCE OF MATERNAL NUTRITION ON LACTATION.

WITH the price of food rising and the difficulties of transport increasing, it is of importance to consider what effect, if any, the nutrition of the mother will have on young infants. Although there appears to be very little probability of any actual shortage of the necessities of life to the civil population of this country, yet the state of refugees retreating before invaders and the occurrence of sieges elsewhere may give rise to conditions which impair the nutrition of the mother to a marked and serious degree. The far-reaching effect of malnutrition on the mother is obviously a subject of considerable importance, but little has been published concerning it. In this connexion a paper read by Mr. G. F. Darwall Smith at a meeting of the Royal Society of Medicine some years ago is very pertinent. The paper was the result of an investigation made for the Local Government Board and the full results have not yet been published so far as we are aware. For the purpose of the investigation over 6000 consecutive cases were taken from the notes of lying-in hospitals in London and Dublin. The nutrition of the mother was estimated by taking her height and weight ratio, the report of the medical officer made especially for the purpose, and the patient's own history as to any difficulty that she may have had in obtaining adequate nourishment. Based on these three criteria, the 6000 cases were divided into three groups of bad, average, and good nutrition. All sources of error, as far as possible, having been excluded, the results and statistical tables were presented with great care. Regarding the mother's capability for suckling, it appears that a poor state of nutrition causes a definite diminution in the patient's ability to suckle. For example, of a thousand unclassified patients over 99 per cent. were able to feed their babies entirely on the breast, but taking patients in a bad state of

nutrition only it was found that under 73 per cent. were able to suckle successfully. Contrary to what might be expected, the state of nutrition of the mother at the time of labour did not have much effect on the progress of breast-fed babies who survived the ten days that they were under observation. It must be remembered, however, that during the puerperium all patients were inmates of a hospital, and so were presumably receiving an ample diet. Mr. Darwall Smith's conclusions were that the figures obtained seemed to suggest that a state of bad nutrition of the mother at the time of labour due to insufficient food (*a*) greatly increases the percentage of premature and also of dead-born babies; (*b*) slightly decreases the weight of the full-term child at birth; (*c*) decreases the ability of the mother to feed the child; and (*d*) greatly increases the post-natal infantile mortality during the first week of life.

A NEW GREEK MEDICAL PAPYRUS.

THE eleventh volume of the "Oxyrhynchus Papyri," which are stored at Oxford, has recently been edited by Dr. B. P. Grenfell and Dr. A. S. Hunt, and published by the Egypt Exploration Fund. It contains one medical manuscript, a Greek recipe for a purge. The ingredients do not present any novelty to scholars acquainted with those commonly to be found in the so-called *hiera* (mixtures) of Græco-Roman times. The text runs as follows: "Ingredients of a purging draught: Cummin 4 drachmæ, fennel 2 dr., parsly 4 dr., costus 4 dr., mastich 4 dr., coriander 7 dr., 21 laurel berries, nut dr., ham (?) dr., pennyroyal dr., silphium (?), salt, vinegar." The number of drachmæ for a few of the constituents has become obliterated. The word πέρνα, rendered "ham," has probably some other meaning indicating a herb, but a comparison with the lists of ingredients in similar Greek recipes has so far failed to suggest which plant it refers to. The word rendered here silphium is φύλλον, which was a title at this period for silphium from Cyrene. Classic medical authors sometimes used φύλλον to indicate betel-nut. Silphium (asafœtida) is almost certainly the correct interpretation. This papyrus also contains two notes upon the healing art as follows: "For strangury, to heal the sufferer, take the dry seed of basil-thyme, crumble it with wine of Ascalon, then drink it hot." The Ascalon wine was celebrated above all the vintages of Syria. The second says: "For treating wounds, take the fruit of a cypress and boil it and apply." The remainder of this fragmentary manuscript is occupied with some partly legible portions of what appears to be an apocryphal gospel concerning healing of the sick, not only human sufferers, but angelic ones, the latter being affected with ocular disease. These sentences are quite obscure.

CHILDREN'S COUNTRY HOLIDAY FUND.—Mr. A. F. Buxton, Chairman of the London County Council, sends us a letter pleading for money and voluntary workers on behalf of the Children's Country Holiday Fund, and asking the public to spare a thought for the thousands of elementary school children whose only escape from London and their own stuffy crowded quarters is the fortnight in the country organised by the Fund. At no previous time in the history of the nation has it been so necessary that the health of children should be preserved in every possible way, and the Children's Country Holiday is a very helpful factor in this direction. It is hoped that about 16,000 of the most suitable little cases may be sent this year to gather fresh stores of health in the country, and donations and offers of help should be sent to the Secretary of the Fund, or to Mr. Buxton, at 18, Buckingham-street, Strand, W.C.

THE DUBLIN RISING.

(FROM OUR OWN CORRESPONDENT.)

YOUR readers are by now familiar with the principal events of the Dublin rebellion of Easter week which have been graphically and, on the whole, accurately recorded in Mr. John E. Healy's letters to the *Times*. I am therefore concerned merely with the medical aspects of the rising.

A considerable number of casualties occurred on Easter Monday in the first few hours of the rising, as the rebels did not hesitate to shoot anyone—soldier or civilian—who hampered them in their activities. The civil population, however, soon learned that the rebels were in earnest, and as long as no active interference was offered the rebels do not seem to have molested civilians to any great extent. Moreover, it was not until Wednesday that the military began any serious attack on the rebel strongholds. It was, therefore, in the latter half of the week, from Wednesday afternoon, when the military began their work seriously, to Saturday afternoon, when the principal rebels surrendered, that the number of casualties was greatest.

Estimate of Casualties.

Of the total number of casualties any estimate is only loosely approximate. The *Irish Times* of May 6th gave a list, compiled from the records of the city hospitals and from other trustworthy sources, of 160 civilians who had been killed. There must have been many more whose deaths have not been reported, and 200 in all is a conservative estimate. The number of soldiers killed is probably somewhat less.[1] Of the rebels no figure can be given. In only a few cases were dead bodies in rebel uniform brought to the city hospitals, though, as many of the rebels wore no uniform and carried no equipment other than a bandolier and a rifle, it is possible that some of those returned as civilians were in truth rebels shot while carrying arms. Of wounds, Jervis-street Hospital, which is in the centre of Dublin, close to the General Post Office, treated some 400 cases. Mercer's Hospital, which is close to the Royal College of Surgeons, treated 130 cases of shot wounds. The City of Dublin Hospital and Sir Patrick Dun's Hospital, which are near the Northumberland-road and Mount-street Bridge area, also treated large numbers, and all the city hospitals, as well as the Dublin Castle Red Cross Hospital and the King George V. Military Hospital received their share. The total may have been anything between 1000 and 2000. The great majority were, of course, civilians, including a large number of women and children. This is, perhaps, inevitable in street fighting, especially when the locality is strange to both troops and officers. The presence of a few rebels, or even of one sniper in a particular house or court, endangered the lives of several score innocent persons, and in many cases those innocent suffered for the guilty. Civilians were also shot by the rebels, chiefly in the first hours of the outbreak.

As the arms varied greatly, so also did the character of the wounds. The wounds produced by military rifles were such as the war has accustomed surgeons to, but the number of head wounds was notably large. Most of these were received by civilians who incautiously looked through their windows while the military were being fired at by rebel snipers in their neighbourhood. The firearms possessed by the rebels seem to have varied within the widest limits. Many of them apparently had serviceable rifles, such as Mausers and Winchesters, but all sorts of arms were used. Many round bullets have been picked up, and it is probable that they were fired from shot-guns, the bullets being substituted for shot in the cartridges. It is said that the rebels were possessed of a few machine-guns.

It is too soon to judge of the effects of treatment, but one may hope that the results will be better than have been generally seen in military operations in France. In the first place, treatment was given speedily, and in the second the clothes of the wounded were fairly clean, and were not, as in France, sodden with infective mud.

Hospital and Ambulance Arrangements.

Some of the hospitals which gave most attention to the wounded have already been mentioned, but as fighting was taking place simultaneously in several quarters of Dublin, all the city hospitals were kept busy. In some instances the wounded could not, on account of danger in the street, gain

[1] The Government casualties have been announced as 124 killed, 328 wounded.

access to the general hospitals, and the special hospitals gave accommodation willingly. In particular, the National Maternity Hospital in Holles-street received a great many civilian patients. The Rotunda Hospital, which was for some time occupied by the troops, also treated casualties and received dead bodies, while the Royal Victoria Eye and Ear Hospital took overflow patients from several institutions.

Two urgency hospitals were opened by the local branches of the British Red Cross Society and the St. John Ambulance Association, one in Merrion-square with 20 beds, and one in Lower FitzWilliam-street with 25. They served as overflow hospitals for Sir Patrick Dun's and Mercer's Hospitals respectively. The staffs of the several hospitals worked under great difficulties. In some cases surgeons were unable to reach their own hospitals at all, and in most cases those who were able to get to their hospitals had perforce to stay there for several days. The members of the staffs of the Adelaide, Jervis Street, the Mater Misericordiæ, and the Richmond Hospitals, for instance, were virtual prisoners in these institutions from Easter Monday or Tuesday to Saturday or Sunday. Many of the hospitals were repeatedly struck by bullets, but I have not heard of any casualty in a city hospital. For a night and a day Jervis Street Hospital was in imminent danger of fire, as the great Sackville-street fire steadily approached it by the two lanes of Henry-street and Abbey-street. The same hospital was threatened by the fire of a big gun, the officer in charge of which was unaware that the building was a hospital. The Adelaide Hospital, close to Messrs. Jacobs's factory, a rebel stronghold, had to stand some rounds from a machine-gun intended for Jacobs's. As the city gas-supply was cut off early in the week operative work in the hospitals was rendered very difficult.

The work of transporting the wounded to hospital was performed with much courage. Royal Army Medical Corps ambulances plied to the Castle and the King George V. Hospitals. The city and township ambulances and the fleet of ambulances organised more than a year ago by the Irish Automobile Club were worked unceasingly, and with consummate courage. Volunteer stretcher-bearers, medical men, medical students, clergy, nurses, dentists, ambulance workers, went unflinchingly wherever they were required. In particular, the nurses of Sir Patrick Dun's exposed themselves in the thick of a fierce battle picking up wounded on Mount-street Bridge. It is right to say that the rebels, equally with the military, appear to have showed respect for the Red Cross, and there is no evidence that it was deliberately fired on. One ambulance worker was unfortunately killed, and three officers of the Royal Army Medical Corps—Major C. A. J. A. Balck, Captain J. T. McCullagh, and Lieutenant H. L. Mooney—were wounded. A nurse was killed in the South Dublin Union. No workers were more unceasing in their exertions than the clergy of the city parishes. They went everywhere, by day and night, trying to keep their parishioners out of danger, distributing food and helping the wounded. One clergyman was severely wounded.

It is impossible to know what arrangements were made by the insurgents for giving relief to their wounded. There is no doubt that in many of the strongholds there were women who had training in first-aid work, but the arrangements must have been crude. Report says that two medical practitioners had associated themselves with the rebels. One is said to have been taken prisoner by the military authorities when they captured the City Hall from the rebels. Another is stated by rumour to have taken an active part as a combatant rebel officer. The daily papers report the arrest, whether on suspicion or not, of a medical practitioner in Galway.

The Difficulties of the Civil Population.

The privations suffered by the civil population from want of food and other supplies were less than might be expected. Traders acted with great consideration, opening their shops in districts where it was at all possible. A large bakery, situated in the southern suburbs, was able to make deliveries to a great deal of the southern part of Dublin, but on the northern side privation was greater. The greatest suffering was in certain of the poorer districts where no one could leave the house without danger of being shot, and many had to choose between the chances of a bullet and of starvation. As few traders would make deliveries, householders had to venture out to bring home their own supplies, and the situation had its humorous aspect. Society ladies and women from the back streets crowded together round the bakers' carts. Judges and staid professional men might be seen hastening across dangerous crossings with bare loaves or joints of meat under their arms. The writer met one of the leading physicians going home after his morning's shopping, and sadly complaining that all he was able to get was a bar of soap! The president of one of the medical associations was seen dragging a bag of coal along the street to his coal-cellar. The hospitals appear to have been sufficiently supplied with stores, and these were augmented as occasion permitted by supplies distributed by the Red Cross depôts. Before the end of the week the authorities had arranged for distribution of food and other necessary stores in different quarters of the city.

Considerable inconvenience was, of course, caused by the military monopoly of the telephone service, but consideration was shown in permitting urgent medical calls to go through whenever possible. Medical men generally, however, have been not a little surprised by the ease with which most of their usual patients dispensed with their attendance for so many days. Chemists, like other traders, showed courage in giving all possible facilities to customers elsewhere than in the actual area of battle.

As the Royal College of Surgeons was one of the first buildings to be occupied by the insurgents, there was much anxiety as to the condition in which the building and equipment would be found. When the rebels evacuated the building, however, on Sunday afternoon it was found that the damage was slight. The windows overlooking St. Stephen's Green were, of course, riddled by rifle and machine-gun fire, and some damage was done to the walls and furniture of the front rooms. Some of the library books had been taken from their places to form barricades, and were more or less damaged. A large portrait of Queen Victoria which was hanging in the board-room was deliberately destroyed. No further wanton damage was done, however, and educational apparatus, furniture, and papers had been treated with respect. It may be added that the condition of the Four Courts, which was also occupied, was similar to that of the College of Surgeons, no wanton damage being done.

Recognition of Services of Medical Men and Nurses.

Dublin is now speedily returning to its normal condition. Martial law is still in force, and citizens are not permitted to be abroad after 8.30 at night. An exception to this rule was made from the first in the case of medical men, but nevertheless a medical man going about at night did so at considerable risk. While sniping was still going on, a sentry was likely to shoot first at anyone out at night and investigate afterwards. At the same time, it is right to say that both officers and men showed every possible courtesy consistent with their own safety to medical men and other citizens going about their lawful business. That the military authorities recognise their debt to the medical men and nurses of Dublin is shown by the generous terms of the following Order issued by the General Officer Commanding-in-Chief:—

Headquarters, Irish Command, Parkgate, Dublin,
7th May, 1916.

I desire to express my sincere appreciation of the services rendered during the recent disturbances in Dublin by the medical, surgical, and nursing staffs of many of the city hospitals, and in particular of the gallantry shown by those nurses who exposed themselves to a heavy fire in attending to and removing the wounded.

Also to the members of the Red Cross and St. John Ambulance Societies and the many medical men and private individuals who gave assistance in attending to the wounded or placed their houses at the disposal of the military for use as dressing-stations.

In numerous instances these services were rendered at considerable personal risk and under circumstances reflecting the greatest credit on those engaged in them.

(Signed) J. G. MAXWELL, General,
Commanding-in-Chief the Forces in Ireland.

DONATIONS AND BEQUESTS.—A bequest of £1000 has been made to King Edward VII. Hospital, Windsor, by Mrs. Golden in accordance with a wish expressed by her late husband. The amount represents Mr. Golden's accumulated savings, which had not been trenched upon by his widow, though her means were very limited.—The Duke of Northumberland has subscribed £300 to the appeal for King's College Hospital, Denmark Hill.—By the will of the late Right Hon. John Frederick Cheetham, M.P., the testator, among other bequests, left £1000 each to the Victoria University of Manchester and the Ashton-under-Lyne District Infirmary.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENTS.)

Bogus Medical Degrees Bill for India.

Sir Pardey Lukis, Director-General, I.M.S., in presenting this Bill in the Imperial Legislative Council, said that replies from authorities consulted showed a very large consensus of opinion in favour of the principle of the Bill. He specially drew attention to the views of the Bombay Medical Union. With very few exceptions, criticisms had been levelled at details. These criticisms would receive sympathetic attention by the select committee. The object of the Bill (which would apply to all medical schools, whether Government or independent) was that no teaching institution should examine its own students, but that it should conform to certain definite standards, should submit to outside inspection, and should affiliate itself to one or more of the sanctioned examining bodies. There were three grades of affiliation—namely, to the licentiateship or membership of the State examining body, the former corresponding to the diploma of the sub-assistant surgeon, and the latter to the old L.M. & S.; or to a recognised university for degrees of M.B., &c. The object of the Bill was to improve the status of the independent medical colleges, not to destroy them. Sir Pardey Lukis said that the College of Physicians and Surgeons of Bengal was recently granted by the Senate of the University of Calcutta provisional affiliation up to the preliminary scientific standard for the M.B. degree. He hoped also that ere long it might be possible to affiliate one of the other independent colleges in Calcutta to the State Medical Faculty of Bengal. Meanwhile Bombay had received a munificent offer of 12 lakhs of rupees from the trustees of Mr. Gordhandas Sundardas for the foundation of a second medical college in that city to be staffed by Indians not in Government service, and to be affiliated to the Bombay University. He trusted most sincerely that it might be possible to utilise this very generous gift, and that the example of its donor might stimulate the rich and charitable nobility and zemindars of Bengal to come forward with the money required to place upon a sound footing the independent medical colleges in Calcutta, to one of which the Government of India had sanctioned a grant of 5 lakhs non-recurring and Rs.50,000 recurring on certain conditions which would, he trusted, shortly be fulfilled. After some criticism, the Bill was referred to a select committee.

Anti-malaria Measures.

In the Imperial Legislative Council Mr. Surendranath Banerjee moved a resolution that Provincial Governments be instructed vigorously to combat malaria, and to report annually the progress made. He said that malaria had decimated some of the fairest parts of Bengal, and strongly urged Government to improve rural sanitation. Sir Edward Maclagan, in reply, said that Government were ready to accept the resolution. What they ultimately wanted were practical measures for preventing or mitigating malaria, but these must always be preceded by investigation. The form of prevention to be adopted differed considerably. Malaria was in some places epidemic and in others endemic. In some places it might be due to excessive water, in others to defective water; in some areas certain measures were feasible, in others they were not, and so on. There were a few general principles upon which action could be taken, and the Government of India had briefly alluded to these in their recent resolution on sanitary policy. But circumstances differed so greatly that Provincial Governments alone were in a position to decide on the measures to be taken. Further, there was the limitation due to finance and the staff which was available at the present time. It could not be properly assumed that there had been any marked increase in the disease in the last few years. But whether it had increased or not, it was their duty to do the best they could to cope with it. Here it might be said without dispute that as regards malaria, more had been done by the Government during the last 10 years in India than by all the Governments during all the preceding centuries. He then gave an account of the anti-malarial work undertaken by the Government of India and the Provincial Governments.

Anti-malaria Operations in Bengal.

At the Bengal Legislative Council on March 15th the Hon. Rai Radha Charan Pal Bahadur moved a resolution to the effect that a sum of one lakh of rupees be allotted for anti-malaria operations in selected areas, preferably in the Presidency Division. He said that malaria was the greatest scourge in Bengal and caused more sickness and misery than any other single disease. The Government had taken certain measures such as the free distribution of quinine and the supply of pure drugs through the agency of travelling dispensaries, but these had been insufficient. He referred to the theory advanced by Dr. C. A. Bentley with regard to getting more water to the surface and scouring out silted-up rivers. He believed that if Dr. Bentley's suggestions were put into effect the Presidency Division would be benefited. The Maharaja of Nashipur supported the motion. Dr. Nil Ratan Sircar said that though there was no question of funds in this case, the expert advice stood in the way of the Government carrying out contentious measures in that province. He referred to the views of the Drainage Committee, who quoted Sir Ronald Ross on the value of jungle-clearing and making the land near habitations water-tidy. But they were now told that these measures would be quack sanitation in Bengal, and that against all anti-malaria measures which had been found successful elsewhere there was only one measure as a remedy for malaria, and that was flooding the country with silt from flood water. The speaker was not against bonification where applicable, but protested against jungle-clearing and draining water-tidiness in proper areas and general sanitation being set down as useless and injurious measures. The Hon. Nawab Shams-el-Huda, in reply, said that Government could not agree to preference being given to the Presidency division, as other divisions and districts were equally malarious. If a suitable scheme were recommended they were prepared to give a lakh of rupees for experiments. The resolution was then withdrawn.

April 13th.

THE SERVICES.

ROYAL NAVAL VOLUNTEER RESERVE.

Surgeon C. F. A. Hereford to the *Vivid*, additional, for disposal.

The following have been entered as Surgeon Probationers for temporary service:—H. Thomson, J. K. Murray, F. Gray, G. E. Rae, N. B. Gadsby, D. L. M. Tod, W. T. Benson, J. N. Gale, St. G. B. B. Gray, J. Allan, J. W. S. Blacklock, D. C. Lamond, M. K. Jardine, G. Paterson, G. W. T. H. Fleming, E. L. Ewan, O. Gray, F. W. Lemarchand, A. B. Macdonald, E. M. Fraser, E. A. Sparks, and D. McClean.

ARMY MEDICAL SERVICE.

Colonel J. Maher, C.B., to be temporary Surgeon-General whilst a Director of Medical Services.

Temporary Colonel A. W. Mayo-Robson, C.V.O., relinquishes his temporary commission.

ROYAL ARMY MEDICAL CORPS.

Majors to be temporary Lieutenant-Colonels:—H. H. J. Fawcett, whilst commanding a Field Ambulance; and R. B. Hole, whilst commanding a Casualty Clearing Station.

To be temporary Lieutenant-Colonels whilst commanding Casualty Clearing Stations:—Major D. L. Harding, D.S.O., and Major R. F. Ellery.

To be temporary Majors:—Temporary Captain G. Taylor; W. J. Prendergast, whilst employed at the 1st Birmingham War Hospital; H. French; and W. C. G. Ashdowne, whilst employed at the 1st County of Middlesex War Hospital.

Temporary Lieutenants to be temporary Captains:—N. L. Prichard, G. Norman, R. McI. Muir, R. H. Rollinson-Whitaker, J. Dunbar, J. H. Johnston, E. Weatherhead, M. Bridgman, B. T. Saunders, R. Williams, C. J. Gibson, W. B. Lawrence, G. A. Renwick, J. R. MacCulloch, C. G. Adams, C. R. R. Huxtable, J. Connell, W. J. Hill, M. H. E. R. Montesole, J. W. Heekes, W. F. Abbott, F. A. Hort, I. Campbell, J. Brown, C. A. Farrell, E. C. Wallace, R. M. Clarke, H. H. Clarke, H. M. Meyrick-Jones, C. J. Butler, B. Sweeten, C. H. T. Ilott, R. C. Fuller, G. F. Holt, R. N. Salaman, J. T. McConkey, C. A. W. Pope, W. T. Hedley, T. Strain, A. G. R. Ritchie G. A. Simpson, D. Cowin, W. S. Langworthy, M. T. MacMahon, C. F. White, R. Richards, W. C. Gavin, J. M. Pooley, E. W. Lynch, W. Salisbury, H. J. Hickin, V. H. Mason, H. E. O'Brien, N. Campbell, P. H. Delamere, A. H. Priestley, J. R. Robertson, J. H. Moir, A. M. Cowie, L. W. Batten, A. D. Bigland, H. R. Dew, R. K. Birnie, J. Morlet, A. Weigall,

G. C. Scantlebury, J. G. Sleeman, W. A. L. H. Henderson, A. W. Bretherton, T. E. George, W. A. Bowman, W. A. H. Birrell, W. Rogerson, W. S. Newton, G. C. Bury, G. B. Courtney, R. McC. Service, J. Porter, F. J. Pierce, R. J. Merson, F. W. S. Stone, L. G. Davies, T. S. McIntosh, J. C. Sale, T. D. Kennedy, K. Simpson, J. Scott, H. M. Spoor, H. F. Nolan, H. H. Moffatt, G. H. Darlington, F. G. Wrigley, J. H. Marshall, A. L. Weakley, V. J. Batteson, G. S. Goodwin, J. Rowat, J. J. Robb, A. M. Warwick, B. E. Wright, C. S. Crichton, W. G. Hopkins, G. S. Applegate, R. M. Walker, A. H. Butcher, A. E. Druitt, R. Kenefick, G. R. Lipp, T. Stansfield, W. J. J. Arnold, W. Carnes, G. W. Stone, R. Stephens, J. C. Waithman, W. R. Etches, F. H. Looney, R. W. Hogg, J. Hughston, W. A. Shann, N. Grellier, D. Johnston, J. W. Turner, T. Warner, and W. C. Blackham.

The undermentioned temporary Honorary Lieutenants to to be temporary Honorary Captains:—E. H. Hicks, whilst serving with the British Red Cross Society in France, and F. W. Hamilton, whilst serving with No. 2 British Red Cross Hospital.

Lieutenant A. B. Brook, from Seaforth Highlanders (T.F.), to be temporary Lieutenant.

Lieutenant H. B. Shillingford relinquishes his commission.

The undermentioned temporary Lieutenants relinquish their commissions: E. Fryer, H. G. L. Gilchrist, R. Moore, W. C. P. Barrett, D. Stewart, and A. Turnbull.

Canadian Army Medical Corps: Lieutenant-Colonel W. A. Scott to be temporary Colonel. Captain W. D. Howell to be temporary Major. J. N. Richards to be temporary Captain. F. W. Sawdon to be temporary Honorary Captain. To be temporary Lieutenants: Captain H. B. Maxwell, Lieutenants C. E. A. Trow, G. Stewart, L. B. W. Braine, T. W. F. MacKnight, E. C. A. Reynolds, R. A. McKay, J. E. O'Donnell, D. L. MacKenna, H. G. Joyce, and G. F. Nelson. Temporary Honorary Lieutenants A. T. Edwards, S. W. Burrell, E. J. Dyke, E. G. Saunders, J. Neligan, A. C. Pickett, D. J. Jackson, J. A. Vlasto, J. J. Walshe, W. Patey, J. E. Ashby, J. H. Lechler, W. A. Steen, F. E. Feilden, V. J. P. Clifford, W. S. Allan, W. H. W. C. Carden, A. Buchanan, G. A. Francis, H. C. Terry, S. H. L. Archer, A. F. Seacome, G. J. Adams, C. Dundee, E. H. Alton, S. Pool, K. Black, and A. Beeley. To be Temporary Honorary Lieutenants: P. E. D. Pank, G. P. B. Huddy, and T. D. Morgan.

INDIAN MEDICAL SERVICE.

The King has approved the promotions of the following officers of the Indian Medical Service:—

Majors to be Lieutenant-Colonels: C. R. Bakhle, K. V. Kukday, C. D. Dawes, T. H. Symons, H. J. Walton, H. Ainsworth, F. A. Smith, J. W. Cornwall, A. Miller, F. A. L. Hammond, H. R. Brown, S. P. James, A. N. Fleming, P. Dee, and F. O. N. Mell.

Captains to be Majors: W. F. Brayne, M. S. Irani, H. Watts, S. W. Jones, (Brevet Major) W. T. McCowen, J. Anderson, E. A. Roberts, and G. G. Hirst.

The King has approved the grant of the temporary rank of Lieutenant to the undermentioned:—A. MacInnes Ramsay, V. M. Kanal, M. L. Dhawan, B. S. Dhondy, Y. V. Khrishnamoorthy, Balkrishna, S. K. Engineer, K. P. Panikkar, J. Sircar, and M. Subramanyam.

SPECIAL RESERVE OF OFFICERS.

Royal Army Medical Corps.

The undermentioned Lieutenants to be Captains:—P. B. Corbett, W. W. Blair, W. W. S. Sharpe, M. J. Graham, P. W. Edwards, and W. H. A. D. Sutton.

A. A. Dear to be Lieutenant (on probation).

TERRITORIAL FORCE.

Army Medical Services.

Lieutenant-Colonel H. H. C. Dent, from North Midland Casualty Clearing Station to A.D.M.S., North Midland Division, with the temporary rank of Colonel.

Royal Army Medical Corps.

West Riding Field Ambulance: Lieutenant C. S. Brown to be Captain.

Highland Divisional Sanitary Section: Lieutenant A. F. MacBean to be Captain.

East Lancashire Casualty Clearing Station: The undermentioned Lieutenants to be Captains: W. Briggs, J. Ramsay, and T. W. Leighton.

North Midland Casualty Clearing Station: Lieutenant-Colonel H. H. C. Dent, from North Midland Field Ambulance, to be Lieutenant-Colonel.

South-Western Mounted Brigade Field Ambulance: Captain L. H. Hay resigns his commission.

London Field Ambulance: Captain N. C. Rutherford, from London Field Ambulance, to be temporary Major.

Lowland Field Ambulance: Lieutenant J. Angus to be Captain.

Eastern General Hospital: Captain O. Inchley relinquishes his commission on account of ill-health.

London Sanitary Company: The undermentioned Lieutenants to be Captains: W. Buddin and E. W. Gregory.

Home Counties Casualty Clearing Station: Captain W. Scarisbrick, from London Field Ambulance, to be Captain. Alexander Wilson to be Lieutenant.

East Lancashire Field Ambulance: Major (temporary Lieutenant-Colonel) W. L. Bentley relinquishes his temporary rank on ceasing to command a Field Ambulance.

Attached to Units other than Medical Units.—T. L. Fennell (late Major, Cheshire Regiment) to be Major. Lieutenants to be Captains: W. H. Buckley and F. R. H. Laverick. J. R. Bulman to be Lieutenant. Lieutenant P. A. Chillcott relinquishes his commission on account of ill-health.

JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

The April issue of this journal gives first place to a report on the Protozoological Findings in 556 Cases of Intestinal Disorder from the Eastern Mediterranean War Area, by Temporary Lieutenant-Colonel C. M. Wenyon, who last year undertook the examination for protozoal infection of a series of cases which had been invalided from Gallipoli for dysentery or other intestinal diseases. The report is in the nature of a preliminary communication, but Colonel Wenyon hopes that it will enable others who are doing similar work to make a comparison with the results they are obtaining elsewhere. This is followed by an account of a search for typhoid carriers among 800 convalescents by Captain A. Stokes and Lieutenant C. Clarke.[1] Lieutenant W. Wallace describes the methods of examining the vision of recruits and soldiers, with special reference to assumed and real defects; Captain J. W. McNee and Lieutenant Arnold Renshaw, who had the clinical assistance of Captain E. H. Brunt, have a joint paper on "Trench Fever," to which is attached a note by Colonel Sir Wilmot Herringham; and Hon. and Temporary Lieutenant-Colonel Sir John Collie writes on Neurasthenia: What it Costs the State.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

IN the 96 large English and Welsh towns 8304 births and 5657 deaths were registered during the week ended Saturday, April 29th. The annual rate of mortality in these towns, which had been 17·7, 17·4, and 16·4 per 1000 in the three preceding weeks, rose to 17·0 per 1000 in the week under notice. During the first four weeks of the current quarter the mean annual death-rate in these towns averaged 17·1, against 17·2 per 1000 in London. During the week the death-rate ranged from 8·4 in Ilford, 8·7 in Southport, 9·7 in Rhondda, 10·2 in Ealing and in Southend-on-Sea, and 10·8 in Dewsbury, to 22·4 in Stoke-on-Trent, 22·6 in Dudley, 22·8 in Burnley, 23·4 in Darlington, and 26·7 in Sunderland.

The 5657 deaths from all causes were 222 in excess of the number recorded in the previous week, and included 431, which were referred to the principal epidemic diseases, against 452 and 416 in the two preceding weeks. Of these 431 deaths, 175 resulted from whooping-cough, 119 from measles, 60 from infantile diarrhœal diseases, 46 from diphtheria, 24 from scarlet fever, and 7 from enteric fever, but not one from small-pox. The annual death-rate from these diseases was equal to 1·3 per 1000, and coincided with that recorded in the previous week. The deaths attributed to whooping-cough, which had been 141, 182, and 146 in the three preceding weeks, rose to 175, and caused the highest annual death-rates of 2·1 in West Ham, 2·2 in Smethwick and in Oldham, 2·7 in Acton, and 3·5 in Darlington. The deaths referred to measles, which had been 121, 120, and 121 in the three preceding weeks, numbered 119; the highest death-rates from this cause were 2·1 in Dudley, 2·7 in Stockton-on-Tees, and 3·2 in Stoke-on-Trent. The fatal cases of diarrhœa and enteritis (among infants under 2 years), which had been 50, 57, and 66 in the three preceding weeks, fell to 60, and included 19 in London, 6 in Manchester, 5 in Birmingham, and 3 in Stoke-on-Trent. The deaths attributed to diphtheria, which had been 45, 65, and 57 in the three preceding weeks, fell to 46, of which 9 were registered in London, 4 in Portsmouth, and 3 each in Stoke-on-Trent and Leeds. The deaths referred to scarlet fever, which had been 15, 16, and 22 in the three preceding weeks, further rose to 24, and included 5 in London, 3 each in Stoke-on-Trent and Liverpool, and 2 in St. Helens. The fatal cases of enteric fever, which had been 8, 12, and 4 in the three preceding weeks, rose to 7, but showed no excess in any town.

The number of scarlet fever patients under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, which had been 1778, 1717, and 1679 at the end of the three preceding weeks, further fell to 1643 on April 29th; 179 new cases were admitted during the week, against 252, 163, and 191 in the three preceding weeks. These hospitals also contained on the date mentioned 1338 cases of diphtheria, 230 of whooping-cough, 174 of measles, and 40 of

[1] THE LANCET, March 11th, 1916, p. 566.

enteric fever, but not one of small-pox. The 1455 deaths from all causes in London were 132 in excess of the number in the previous week, and corresponded to an annual death-rate of 17·6 per 1000. The deaths referred to diseases of the respiratory system, which had declined from 405 to 314 in the six preceding weeks, further fell to 295 in the week under notice.

Of the 5657 deaths from all causes in the 96 towns, 198 resulted from violence, 400 were the subject of coroners' inquests, and 1671 occurred in public institutions. The causes of 49, or 0·9 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest. All the causes of death were duly certified in Leeds, Bristol, West Ham, Bradford, Hull, and in 69 other smaller towns. Of the 49 uncertified causes, 10 each were registered in Birmingham and Liverpool, 4 in Gateshead, 3 each in Stoke-on-Trent and Manchester, and 2 each in Leicester and Sunderland.

HEALTH OF SCOTCH TOWNS.

In the 16 largest Scotch towns with an aggregate population estimated at 2,372,000 persons at the middle of this year, 1249 births and 791 deaths were registered during the week ended Saturday, April 29th. The annual rate of mortality, which had been 20·5, 17·6, and 17·4 per 1000 in the three preceding weeks, was again 17·4 per 1000 in the week under notice. During the first four weeks of the current quarter the mean annual death-rate in these towns averaged 18·2, or 1·1 per 1000 above that recorded in the large English towns. Among the several towns the death-rate during the week ranged from 8·9 in Kirkcaldy, 10·3 in Coatbridge, and 10·7 in Falkirk, to 20·6 in Clydebank, 21·1 in Dundee, and 28·7 in Perth.

The 791 deaths from all causes were equal to the number in the previous week, and included 65 which were referred to the principal epidemic diseases, against numbers declining from 96 to 67 in the four preceding weeks. Of these 65 deaths, 28 resulted from measles, 11 each from whooping-cough and infantile diarrhœal diseases, 10 from scarlet fever, 4 from diphtheria, and 1 from enteric fever, but not one from small-pox. The annual death-rate from these diseases was equal to 1·4, against 1·3 per 1000 in the large English towns. The deaths attributed to measles, which had been 36, 42, and 31 in the three preceding weeks, further fell to 28, and included 17 in Glasgow and 2 each in Edinburgh, Paisley, and Greenock. The deaths referred to whooping-cough, which had been 10, 4, and 14 in the three preceding weeks, fell to 11, and comprised 8 in Glasgow and 3 in Aberdeen. The fatal cases of diarrhœa and enteritis (among infants under 2 years), which had been 8, 13, and 9 in the three preceding weeks, rose to 11, of which 5 occurred in Glasgow and 2 in Dundee. The deaths attributed to scarlet fever, which had been 14, 8, and 5 in the three preceding weeks, rose to 10, and included 3 each in Glasgow and Paisley. The 4 deaths from diphtheria, of which 2 were registered in Paisley, were 3 below the average in the earlier weeks of the quarter. The fatal case of enteric fever was recorded in Aberdeen.

The deaths referred to diseases of the respiratory system, which had been 193, 167, and 168 in the three preceding weeks, fell to 159 in the week under notice, but were 6 in excess of the number registered in the corresponding week of last year. The deaths from violence numbered 26, against 23 and 24 in the two preceding weeks.

GUY'S HOSPITAL.—The following entrance scholarships in dental mechanics have been awarded:—Open scholarship, A. F. Bartle (£20); Pupils' scholarship, R. S. Roche (£20).

KING EDWARD VII. SANATORIUM, MIDHURST.—The annual report of this institution for the year July, 1914, to July, 1915, has reached us, and shows a record of good work. Seventy beds were set apart for the reception of soldiers suffering from tuberculosis, but in June, 1915, the National Insurance Commissioners having become responsible for the care of the consumptive soldier, the arrangements between the sanatorium and the War Office came to an end. During the year 352 patients were discharged, of whom 258 were civilians and 94 officers, non-commissioned officers, and men from various branches of H.M. forces. Among patients in whom the diagnosis of pulmonary tuberculosis was confirmed by the detection of bacilli in the sputum, 232 in all, the disease was arrested in 31 cases. The condition was much improved in 103 cases, improved in 33, remained stationary or became worse in 63, while 2 died. Among War Office patients in a similar category, 78 in all, the condition was arrested in 4 cases, much improved in 35, improved in 21, remained stationary or became worse in 15, and 3 died. Owing to the first assistant medical officer and the pathologist having joined the Royal Army Medical Corps, the research work of the laboratory has been suspended temporarily, though provision has been made for the examination of sputum and for the carrying out of other clinical methods.

Correspondence.

"Audi alteram partem."

THE USE OF THE TOURNIQUET:

A PLEA FOR ITS MORE THOROUGH USE IN PEACE AND WAR.

To the Editor of THE LANCET.

SIR,—I believe that if the full value of the tourniquet were properly appreciated it would be far more commonly and thoroughly used, especially in dealing with the wounded who are already suffering from loss of blood. These patients are badly affected by further bleeding. Sir George Makins, with his large experience, makes this point very clear[1]: "The loss of blood which accompanies the receipt of the injury is often very considerable; and although it may not immediately endanger the patient's life seriously, or call for surgical intervention to prevent its recurrence, yet the resulting anæmia is often persistent for some time, and may heavily handicap the patient's chances should a secondary operation become necessary. It has, indeed, much surprised me to see patients die a few hours after an operation in which, although a considerable amount of blood has been lost during the procedure, yet the patient has left the table in sufficiently good condition for no great anxiety to have been felt regarding his ultimate recovery. I believe this to be a definite sequence of the primary loss of blood, and it is a moment to be fully considered should the question of the performance of any operation likely to entail loss of blood arise."

The risks of sepsis and other complications are also increased by hæmorrhage. For these reasons it is especially important for us to do all we possibly can to prevent further bleeding. How are we to do this? By adopting a plan which I have found very valuable for many years in civil practice.

(A) For all operations upon the limbs a tourniquet is used and is not removed until the dressings are firmly applied.

(B) For all other operations: (*a*) The main artery or arteries are temporarily clamped or tied at the beginning of the operation whenever possible. Failing this (*b*) the small vessels are clamped before instead of after division.

(A) 1. After the limb has been well raised for several minutes to diminish the amount of blood in it, a good flat tourniquet is very tightly applied over lint around the limb well above the field of operation. The tourniquet must be very tight and have a reliable catch, for an imperfectly applied tourniquet obstructs the veins but not the arteries, and therefore increases the congestion of the limb and may cause severe bleeding. When the tourniquet is applied only a few drops of blood should escape, and a perfectly clear field is obtained for accurate work. No sponging is required, more perfect work can be done and much manipulation and time saved, and soaking of the tissues with blood prevented. Spread of infection in the septic military cases now so prevalent is thus rendered far less likely. Foreign bodies, like fragments of shell, can be far more easily and quickly found. The large vessels and nerves are easily recognised and avoided. Any large vessel that has to be divided—a rare event except in amputations—is tied. Shock is almost eliminated, for there is no loss of blood, and manipulations are reduced to a minimum. Very little anæsthetic is required, for the time of the operation is much shortened and the conduction of painful impulses to the spinal cord is diminished by the tourniquet. 2. At this stage most surgeons remove the tourniquet so that they may see and tie the bleeding points, but this step is unnecessary and wasteful of both blood and time; moreover, it adds to the risk of spreading sepsis already existing. When the main work of the operation has been done all dead spaces are carefully obliterated by catgut sutures so that no bleeding or effusion may take place into these spaces. Then the wound is completely closed in all aseptic cases, but in septic cases the wound is not completely closed, a gap about an inch long being left for drainage, but no gauze or tube is inserted except when the wound is deep and it is impossible to obliterate the cavity. 3. The skin is painted with tincture of iodine and aseptic gauze is applied, and the limb is surrounded by a large amount of aseptic cotton-wool. Bandages are then firmly applied to exert elastic pressure at, above, and below

[1] British Journal of Surgery, January, 1916.

the wound. Massive dressings must be used and the bandaging carefully done in order to exert the proper amount of pressure without causing pain. The bandaging must be completed before the tourniquet is removed, for the object is to exert the elastic pressure before the circulation is restored. On the principle of the Bramah press, a moderate amount of pressure serves to prevent bleeding into the wound if it is applied first, whereas an enormous pressure may be of no avail when a pool of blood has been allowed to form in the recesses of the wound. It may be remembered that in the Bramah press hydrostatic pressure is exerted through a small pipe to the bottom of a wide cylinder. The lifting power of the water in the cylinder is enormously greater than that in the feeding pipe. The same is true of the small arteries and the pool of blood in a wound when the dressing is not applied until the tourniquet has been removed. That this is not a mere theory is shown by the results. Rarely is there any appreciable bleeding and very rarely is there sufficient to soak through the dressings, and this is almost limited to extensive wounds requiring drainage. Even in these cases the loss of blood is comparatively trivial. It has been suggested that in the septic wounds of military practice this method adds to the danger of spreading sepsis. My experience is distinctly the other way. When the patient is returned to bed the limb is moderately elevated, for this diminishes pain and bleeding and prevents swelling of the terminal parts of the limb, which may otherwise be noticed as a result of firm bandaging. For clean cases I have used this method with the most satisfactory results for many years, having gradually put it to the test with more and more severe operations until at last I used it with the greatest confidence in cases of extensive resection of bone for the correction of severe talipes. Later, being much impressed with the detrimental effect of the severe loss of blood involved in the operations for acute infective osteomyelitis and for sequestrotomy, and during this war, I have tentatively extended the method to the septic wounds now so common, and with very satisfactory results. Therefore I have every confidence in recommending it, and I believe its adoption may lead to the saving of many lives, and also promote the more rapid and perfect healing of wounds.

(B) 1. Every surgeon is familiar with the great value of preliminary ligation of the lingual arteries in resection of the tongue. Similarly for removal of glands in the neck Crile's method of temporary clamping of the main vessels at the root of the neck is of the greatest value, making extensive operations more easy, radical, and expeditious to the great advantage of the patient. The principle can be safely extended to the military surgery of these parts In the abdomen preliminary clamping or ligation is an established and beneficent principle, as, for instance, in gastro-jejunostomy, partial gastrectomy, resection of the bowel for growth or injury, and operations on the kidney. By this method many abdominal operations which were regarded as impossible on account of bleeding have been made comparatively easy and safe. 2. In many cases clamping and ligation of the main vessels being impossible, other methods have to be used. In these cases the individual vessels to be divided should be secured before instead of after division whenever possible.—I am, Sir, yours faithfully,

R. P. ROWLANDS, M.S. Lond., F.R.C.S. Eng.,
Surgeon to Guy's Hospital; Captain, R.A.M.C. (T.).
Queen Anne-street, W., May 6th, 1916.

INSURANCE BENEFITS.

To the Editor of THE LANCET.

SIR,—In the "Parliamentary Intelligence" of THE LANCET of April 8th (p. 804) there is reported a question which the Rt. Hon. C. Stuart-Wortley, M.P., addressed to the National Health Insurance Commissioners with reference to the manner in which the Prudential Assurance Society administers sickness benefit to its members. The case which led to the question was that of a woman suffering from advanced heart disease and dropsy absolutely unfit for work. She was deprived of her sickness benefit after a medical referee sent by the Prudential Assurance Society had made a cursory examination *without notice to or consultation with the panel doctor.* This case was brought to the notice of the London Mendicity Society, who obtained a further medical examination by the Prudential Assurance Society and as a result the sickness benefit was resumed and the arrears paid up. Mr. Charles Roberts's answer to the question in the House of Commons in certain particulars is only partially correct, whilst in others he has been absolutely misinformed.

Perhaps it would be as well to state clearly from personal experience what happens when the Prudential Assurance Society suspects that one of its members is malingering. The member receives a written notice that either (*a*) the society's doctor will call on the next day (it is exceptional for a longer notice than 24 hours to be given), or (*b*) the member is required to attend at a stated place for examination. In some cases this may involve a whole day's travelling and a complicated railway journey. At the same time the doctor in attendance on the patient is, as a rule, but not always, notified that the examination is to take place. More often than not this notice only arrives on the day fixed for the examination. In some cases no hour is given for the consultation, and if the time is stated the medical referee usually does not keep to it. From my own experience I can definitely state that the examination is of the most cursory character—the average time is apparently about three minutes. In not a single case that I have come across (and there are many) has the medical referee had the benefit of hearing the patient's past medical history from his (or her) own medical attendant. As the result of this medical (!) examination the society has the power, and frequently exercises it, of suspending the member from further sickness benefit. Mr. Charles Roberts states that in these cases "the member is furnished with information as to the course which she may pursue if dissatisfied with the society's decision." I do not know of any case in which a member was provided with this information, but I know of many in which it was not done.

Now, if these are facts—and I can guarantee that they are—there is obviously something very wrong. Quite apart from the discourtesy shown to the medical attendant, such methods cannot provide the society with the requisite information for forming a correct judgment upon the case, and as for the wretched member, such treatment surely savours of the autocratic and brutal methods of the Hun. Unfortunately, I believe it to be a fact that the Commissioners have no power over the internal affairs of a society. Further, so great is the power that a society like the Prudential exercises, that very few Members of Parliament can be induced to take the matter up. If, then, any change is to be effected it must be by the concerted action of the medical profession, and I would suggest that as a start any medical man having a similar experience to mine should communicate the details to me as soon as possible. By tabulating a large number of cases we may be able to influence public opinion to such an extent that the society will be forced to take action. I myself know of one case where a patient who had been declared by the authorities at a well-known hospital to be in a serious state of consumption, was considered by the society's referee "fit to resume work," and was sent to work against the advice of the hospital authorities and her own medical attendant. And this after three minutes' examination. In another case an epileptic domestic servant was declared "fit for work," but, unfortunately for her, with her bad medical history, no one will employ her.—I am, Sir, yours faithfully,

W. JAMES SUSMAN,
Chairman of the Oxfordshire Panel and Local Medical Committee.
Henley-on-Thames, May 5th, 1916.

PNEUMOCOCCAL BRONCHITIS.

To the Editor of THE LANCET.

SIR,—Sir James Goodhart's interesting article on this subject appearing in your issue of April 29th raises important questions concerning the classification and diagnosis of pulmonary disease. The clinical picture presented by pneumococcal and tuberculous infections is often so similar that one does not know whether pulmonary disease should be classified from the bacteriological or clinical point of view. Dr. Michell Clarke[1] some time ago gave several cases where Friedländer's bacillus was the chief morbific agent in causing pulmonary lesions simulating tuberculous infection. In the course of 17 years of sanatorium work I have collected 23 cases where nothing but some forms of cocci were seen in the sputum, though they presented more or less classical symptoms of consumption. Besides, it is common experience that cases of pulmonary tuberculosis are accompanied with no sputum or, if present, the sputum contains no pathogenic organism. Fishberg calls such cases "abortive tuberculosis"

[1] Bristol Medico-Chirurgical Journal, March, 1914.

and Neisser "tuberculosoid." In fact, some of the cases with severest pulmonary symptoms are associated with streptococcal infection. So that, roughly speaking, we have to deal with three classes of pulmonary consumption: cases with clinical symptoms of consumption—(*a*) with tubercle bacilli in the expectoration; (*b*) with pneumococci, or Friedländer's bacilli, with or without staphylo- or strepto-cocci, &c.; (*c*) with no micro-organism whatever in the sputum. If we are to classify these cases according to bacteriology, are we sure that the examination of sputum gives an accurate representation of the process, morbid or otherwise, going on in the lungs? and what if both cocci and tubercle bacilli were present? If pathogenic bacteria of the respiratory tract are frequently the primary invaders of the lung tissue causing symptoms similar to those of pulmonary tuberculosis, why should such cases be called "bronchitis"? Would it not be better to restrict the name "pulmonary tuberculosis" to the first class and classify the second and third classes together as "phthisis"?

Again, I have notes of three more cases where cocci which were first seen all over the field were gradually replaced to some extent by tubercle bacilli. The frequent presence of pneumococci together with tubercle bacilli in the sputum raises another question—Is tubercle bacillus a separate biological or pathological entity, or is it but a phase in the life-history of some other organism? If, according to the investigations of Dr. M. C. W. Young[2] and others, cocci can be found to pass directly into bacteria on certain media, and acid-fast bacilli can arise from a sort of sporocyst, is it unreasonable to assume that there may be a close morphological relation between pneumococci and tubercle bacilli?

I am, Sir, yours faithfully,

Mendip Hills Sanatorium, Wells, May 8th, 1916. C. MUTHU.

A SIMPLE APPARATUS FOR IONIC MEDICATION OF THE URETHRA.

To the Editor of THE LANCET.

SIR,—Difficulty in obtaining the necessary apparatus about a year ago for this method of treatment caused me to devise the following which in my hands has answered so well, that as this form of treatment appears to be coming into more general use, and as also there still seems a difficulty in obtaining the apparatus, I am induced to publish this note.

Materials required are: (1) the primary battery; (2) a Junker's chloroform inhaler; (3) a piece of thin wire, preferably platinum, 4–6 inches long; (4) a small electrical terminal junction with two screws; (5) a length of rubber-tubing with stopcock; and (6) a rubber catheter. Heat a medium-sized needle to redness and pierce a number of holes for a length of 1 inch in the catheter, starting 1½ inches from the opening at the distal end of the catheter. One inch from the proximal end pierce the catheter diagonally with the wire and thread down the lumen, leaving about an inch projecting for attachment of the electric terminal. Reverse the bellows of the Junker so that pressure will drive air down the short tube, and attach tube with stopcock to other end. The solution I have used is a 2 per cent. solution of zinc sulphate. One ounce of this is placed in the inhaler and an equal amount of hot water. Pressure on the bellows is applied and the solution forced along the tube until it reaches the stopcock, which is then turned off. It is then stood in a basin of hot water to keep warm. Direct the patient to partly empty the bladder, then pass catheter until urine starts to flow, and then withdraw until flow ceases, when the holes in the catheter will be opposite the prostatic portion of the urethra. Join up the tube with stopcock to the catheter and raise the pressure till the patient's feelings tell him that the urethra is full of solution, and finally connect wire to battery lead. The bellows and stopcock between them enable any required pressure to be kept up, and, provided this is not excessive, I have found no need for any flange on the catheter to prevent fluid escaping from the end of the penis. This can easily be made, however, by piercing a rubber cork with a hot skewer and leaving for a couple of days to harden. The catheter is then threaded through the hole and the cork can be set at any required distance from the distal end of the catheter, thus acting as an indicator for any particular patient and allowing the holes in the catheter to be at once set in any required portion of the urethra. I am, Sir, yours faithfully,

Sutton Court-road, Chiswick, W., May 8th, 1916. H. O. BUTLER.

[2] Brit. Med. Jour., Oct. 24th, 1914.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue:—

Killed.

Lieutenant A. Booth, R.A.M.C., attached to the King's Own Scottish Borderers, graduated M.B., B.Ch. Oxon., in 1912, and was a medical officer at the Herts County Asylum before joining the R.A.M.C. in November, 1915.

Died.

Deputy-Surgeon-General C. J. Mansfield, R.N., M.V.O., graduated M.B., C.M. Aberd. in 1883, and M.D. in 1896.

Captain N. J. L. Yellowlees, Canadian Army Medical Corps.

Wounded.

Major P. Sampson, D.S.O., R.A.M.C.

Captain A. S. Plant, R.A.M.C., attached to the Royal Field Artillery.

Captain O. L. V. de Wesselow, R.A.M.C., attached to the Worcestershire Regiment.

THE DUBLIN REVOLT.

The following casualties amongst medical officers are reported:—

Wounded.

Lieutenant H. L. Mooney, R.A.M.C.

Captain J. T. McCullagh, R.A.M.C. (a correction for Captain *W. McK. H.* McCullagh, R.A.M.C., reported wounded in our last issue).

Captain G. F. Denning, R.A.M.C.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who have fallen during the war:—

Lieutenant-Colonel W. F. Bourne, Indian Army, eldest son of the late Dr. W. Bourne, of Cheltenham.

Captain R. K. MacGregor, R.A.M.C., only son of Dr. R. D. MacGregor, of Clerkenwell, London.

Lieutenant W. H. Wyatt, East Yorkshire Regiment, only son of the late Dr. W. T. Wyatt, of Stoke Newington, London.

Second Lieutenant N. H. Collins, Royal Inniskilling Fusiliers, only son of Dr. J. V. Collins, of Laghey, co. Donegal.

MENTIONED IN DESPATCHES.

The names of the following medical officers are to be added to the names published in THE LANCET of Feb. 5th, 1916, in connexion with Sir Ian Hamilton's despatch of Dec. 11th, 1915, concerning the operations in Gallipoli:—

Army Medical Service.—Surg.-Gen. W. Babtie, V.C., C.B., C.M.G.; Col. C. A. Ballance, M.V.O.; Col. F. D. Bird, Col. A. E. Garrod, F.R.S.; Col. Sir V. A. H. Horsley, F.R.S.; Col. W. Hunter, Col. V. W. Low, Col. A. W. M. Robson, C.V.O.; Col. C. S. Ryan; Col. J. P. Stewart, Col. C. J. Symonds, Col. F. M. Sandwith, Col. W. Thorburn, Col. A. H. Tubby, and Col. W. H Willcox.

Royal Army Medical Corps.—Maj. J. G. Bell and Lieut. W. N. Rishworth.

Royal Army Medical Corps (T.F.).—Lt.-Col. E. V. Gostling and Maj. (temp. Lt.-Col.) C. H. Lindsay.

Canadian Army Medical Corps.—Lt.-Col. F. Etherington, Lt.-Col. S. H. McKee, and Maj. E. G. Davis.

General Sir John Nixon, K.C.B., in a despatch dealing with the operations in Mesopotamia in October, November, and December, 1915, says:—

Major W. C. Croly, R.A.M.C., has been in medical charge of the Staff at General Headquarters, and has shown himself always the right man in the right place, and to have taken the keenest interest in his work and care of those whom he had in charge. The medical services have had to face very trying and unusual conditions. On more than one occasion the number and severity of the casualties have thrown the greatest strain on them, but the organisation and efficiency of the arrangements have ensured as speedy an evacuation of the wounded as the means placed at their disposal permitted. In this connexion I wish to bring forward the name of Surgeon-General H. G. Hathaway. The British General Hospital has throughout been in charge of Lieutenant-Colonel D. J.

Collins, Royal Army Medical Corps, whose zeal, energy, and organising power have rendered it a model hospital of its kind. Credit is also due to Lieutenant-Colonel G. B. Irvine, Indian Medical Service, for his devoted and careful supervision of the Indian General Hospital.

Captain W. H. Hamilton, I.M.S., is also mentioned for having rendered good service.

OBITUARY OF THE WAR.

CYRIL JAMES MANSFIELD, M.V.O., M.D. ABERD.,

DEPUTY SURGEON-GENERAL, ROYAL NAVY.

AFTER an illness of four weeks—suppurating cervical glands followed by septicæmia—Deputy Surgeon-General Mansfield died on May 7th at Haslar, where he had worked as senior medical officer of the medical section since July of last year. Born on June 19th, 1861, he was the youngest and only surviving son of the late Rev. Edward Mansfield, vicar of Highnam, Glos., and was a descendant of the well-known Chief Justice of Common Pleas and a relation of Lord Sandhurst. He was educated at Cheltenham, qualified M.B., C.M. at Aberdeen in 1883, and proceeded to M.D. in 1896. Entering the Royal Navy in 1885, he subsequently had an extensive experience in the cadet and boys' training establishments of the Royal Navy, having been surgeon in the old *Britannia* (1892–3), fleet-surgeon at the Royal Naval College, Osborne (1905–9), while the present Prince of Wales was in residence, and in H.M.S. *Impregnable* (1911–13). After the last appointment he was deputy surgeon-general at the Royal Naval Barracks, Chatham (1914–15). A hard-working officer, he was most unselfish and kindly to patients and colleagues alike, and was therefore universally respected and beloved. He was created M.V.O. in 1909. The naval funeral took place at Haslar on May 10th.

PHILIP DOBSON PICKLES, L.M.S.S.A.,

SURGEON, R.N.V.R.

Surgeon P. D. Pickles, who died in the Malta Naval Hospital on April 28th after being rescued from H.M.S. *Russell*, mined in the Mediterranean, was the eldest son of John J. Pickles, surgeon, of Camp-road, Leeds. He was educated at the Leeds Grammar School and Leeds University and qualified in 1908. After holding the post of resident physician at the General Infirmary at Leeds for six months he took a ship surgeoncy to India, and finally settled down in practice at Earby, near Skipton. Joining the Royal Naval Volunteer Reserve early in 1914, he was present at the Naval Review at Spithead in July that year, and on the outbreak of the war he was recalled to his ship, and served on her until the disaster occurred, when he was overcome by the fumes and removed to hospital. Surgeon Pickles was 33 years of age and unmarried. He had four brothers in the services, three of whom are medical officers.

SOCIETY OF MEMBERS OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND AND THE SUPPLY OF MEDICAL OFFICERS FOR THE SERVICES.

Dr. Sidney C. Lawrence, honorary secretary of the Society of Members of the Royal College of Surgeons of England, writes to us as follows:—

I am instructed to forward you for publication in your paper a copy of a letter addressed on behalf of this Society to the Royal College of Surgeons of England and the Conjoint Advisory Committee of that College, and the Royal College of Physicians of London.

[COPY.]

To the Secretary, Royal College of Surgeons of England.

SIR,—At a recent meeting of the Council of this Society a resolution as under was passed unanimously, and I was instructed to acquaint you with the same in order that it may be brought to the notice of your Council and of the Advisory Committee of the English Royal Colleges of Physicians and Surgeons:—

"That this Society is strongly of opinion that the paid services of medical men over military age should be more utilised for whole- or part-time duty at home barracks, civil and military hospitals, &c., so as to free younger men for active service abroad; that where medical men, ineligible for war duties, could not be found for out-patient departments of civil hospitals, or tuberculosis or school medical work, such departments should be at once closed for the duration of the war; that the Government should withhold their approval of the appointment of men of military age to vacancies arising in the Poor-law or Public Health Services or in any public appointment until the conclusion of the war, and that in every case such appointments be only made for the duration of the war or until six months after the conclusion of peace, as under present conditions fair competition for such posts is impossible and shirkers are thereby unduly favoured."

Yours faithfully,

SIDNEY C. LAWRENCE.

THE WITTENBERG CAMP.

At its quarterly meeting on May 2nd the Royal College of Physicians of Edinburgh resolved to offer its Diploma of Membership to Major Harold Edgar Priestley, Captain Alan Cunliffe Vidal, and Captain James Lafayette Lauder, in appreciation of their conduct as physicians at Wittenberg.

THE ALLIES' HOSPITAL AT YVETOT.—The report of the Allies' Hospital which has been carried on since November, 1914, in disused buildings of a large monastic boys' school at Yvetot, states that up to Dec. 31st, 1915, 1380 patients received treatment. The number of deaths has been 16, including four who were in a hopeless state on admission. The average total cost per patient treated has been £7 9*s.* 3*d.*; the catering bill was fr.1.50 per day per head. The French orderlies, cooks, &c., and the clerical office staff receive a nominal salary, but the British staff is an honorary one. There are some 300 beds available. The buildings were lent by the French Government. The renovation and equipment as a hospital, however, required an outlay of £5634, and in order to defray these initial expenses and to ensure continual financial support the Allies' Benevolent Society was established and registered under the Friendly Societies' Acts for the sole purpose of administering and financing the institution. Dr. and Mrs. F. S. Pearson, who were among the unfortunate victims in the *Lusitania* disaster, rendered invaluable service in founding the society. Dr. Fitch, of Rochester, U.S.A., gave his professional services for several months and made a handsome donation of £800.

UNION JACK CLUB EXTENSION.—Mr. H. G. Morgan has undertaken, with the approval of the First Lord of the Admiralty and the Secretary of State for War, the organisation of an extension fund for the Union Jack Club. All civilians owe a debt of gratitude to the fighting forces, and there ought to be a generous response to the appeal on behalf of a club which does such good work for our sailors and soldiers. Contributions should be sent to the honorary treasurer, Union Jack Club, Waterloo-road, S.E., or to Messrs. Coutts and Co., 440, Strand, W.C. Offers of service should be addressed to Mr. Morgan at the Club.

Obituary.

THOMAS COLCOTT FOX, M.B. LOND., F.R.C.P. LOND., M.R.C.S. ENG.,

LATE PHYSICIAN FOR DISEASES OF THE SKIN, WESTMINSTER HOSPITAL, ETC.

Dr. T. Colcott Fox, who died on April 11th, at the age of 67, was the son of Dr. L. O. Fox, of Broughton, Hants. He received his early education at University College School, and afterwards went to Cambridge as a natural science scholar at Peterhouse. After graduating in arts at Cambridge, he returned to University College to study medicine. In 1876 he obtained the M.R.C.S. Eng. and graduated M.B. at the University of London. In 1883 he obtained the M.R.C.P. Lond., and was elected a Fellow of the College in 1892. Among his early appointments was that of medical superintendent of the Fulham Small-pox Hospital; he afterwards became physician for diseases of the skin at Westminster Hospital, and visiting dermatologist to the ringworm schools of the Metropolitan Asylums Board. He had also held the posts of physician to the Victoria Hospital for Children and to the St. George and St. James's Dispensary, and was consulting physician to the skin department of the Paddington Green Children's Hospital. Conjointly with his brother, Dr. Tilbury Fox, he was the author of an "Epitome of Skin Diseases," and also contributed largely to medical literature on dermatology.

Dr. H. G. Adamson writes as follows:—

It was my good fortune to have been associated with the late Dr. Colcott Fox as his assistant in hospital work during several years, and to have thus had the benefit of his teaching and example. Many of those who now practise dermatology in London have been similarly pupils of Dr. Fox; and none can have worked with him without being in some degree infected by his enthusiasm, without gaining much from the example of his accuracy in clinical observation, without gleaning something from his vast store of knowledge of the literature of diseases of the skin, and without being stimulated by his kindly advice and criticism. Dr. Colcott Fox regarded himself as one who wrote little, but while he was no prodigal writer he actually contributed very largely to the literature of dermatology. His contributions were often brief, for the reason that he was careful always that every fact and statement should be as nearly as possible scientifically accurate. Several complaints with which we are now familiar were first observed and noted by him, and he helped very largely to sift out and to establish the identity of a good many more. Among the diseases with which the name of Colcott Fox will always be associated are the now well-known papular urticaria of childhood—lichen urticatus; a vacciniform dermatitis of babies; "ringed eruption," now known as granuloma annulare; dermatitis fictu of neurotic women and of malingerers; and the whole group of tuberculides. He was an authority on drug eruptions, and edited and contributed valuable notes to Morrow's monograph on this subject. In more recent years he carried out a large amount of research work in connexion with the biology of ringworm, and a few years before he retired from practice he wrote for Allbutt and Rolleston's "System of Medicine" articles upon the eruptions of staphylococcic and of streptococcic origin, pityriasis, botryomycosis, urticaria, angioneurotic œdema, urticaria pigmentosa, lichen urticatus, erythema, granuloma annulare, prurigo, Schamberg's disease, pemphigus and the pemphigoids, epidemolysis bullosa, and mycosis fungoides. Each of these articles is a monograph stamped with his characteristic thoroughness, and embodying his own particular views and his extensive knowledge of literature of the particular subject dealt with. Throughout his career it was the hobby of our late beloved master to gather together the numerous monographs upon the diseases which he made his life's study, and he left as a legacy to future dermatologists his unique and invaluable collection which is now in the library of the Royal Society of Medicine, and which bears upon its volumes the following inscription: "In Usum Amicorum et Fratrum Hunc Librum D.D. Thomas Colcott Fox, M.D. MCMXIII."

We are indebted to Dr. J. J. Pringle for the following appreciation of Dr. Colcott Fox, who was certainly one of the ablest dermatologists that the English schools have produced:—

I trust that I may be permitted to add some remarks to your obituary notice of my friend Colcott Fox. His work, being almost exclusively dermatological, was consequently duly appreciated only by fellow workers in the same branch of medicine. But both at home and abroad his conspicuous merit received full recognition, and I can confidently say that he influenced British dermatology more powerfully than any of his contemporaries. Peculiarly graceful appreciation of this fact was acknowledged by Sir Malcolm Morris, when he yielded pride of place to him as President of the Dermatological Section of the Royal Society of Medicine in succession to the late Dr. Radcliffe Crocker. Almost all of our most prominent dermatologists of the present day must be included among his pupils and came under the spell of his enthusiasm; their devotion to him was justifiably great and by them his teaching will be handed down to posterity. Colcott Fox's name is not associated with any startling discovery or linked on to any special disease; he wrote no popular text-book; he was too conscientious to condescend to the perpetration of professional "pot-boilers." But he traversed and illuminated the whole length and breadth of the dermatological field, and touched no subject without adorning it. His consummate mastery of detail did not militate against his breadth of conception; he saw both the trees and the wood. I was associated with Colcott Fox for 15 years as co-secretary of the Dermatological Society of London, and during that time I learnt to appreciate his many qualities of heart and mind, his wonderful toleration of everything, except humbug, pretension, or crookedness, and the extraordinary depth and manysidedness of his knowledge. Had he cared to do so, he might have claimed priority of observation of many cutaneous conditions which have been accredited to others; but his almost overwhelming generosity constrained him from doing so. No more lovable man ever existed; his friends were many and true-hearted, and their deepest sympathy goes out to his mourning widow who guarded him and guided him with such exquisite solicitude and tenderness throughout the dark days of his failing years.

WHARTON P. HOOD, M.D. ST. AND., M.R.C.S., L.S.A.

Dr. Wharton Hood, who at his recent death was in his eighty-third year, was the son of Dr. Peter Hood, a well-known London practitioner. In 1855 he became a Member of the Royal College of Surgeons of England, and graduated as M.D. St. And. in 1862. He received his medical education at King's College, and was house physician to King's College Hospital. Later he became exceedingly well known as a surgeon for cases of sprain and joint injury.

The story of how Wharton Hood took up the class of practice with which his name is so well associated is curious. Hutton, a well-known bone-setter in the "sixties," was ill and was attended by Dr. Peter Hood. In return for his attendance Hutton offered to teach the son of Dr. Peter Hood his methods. On the advice, with certain qualifications, of Sir James Paget and Sir William Fergusson, Hood accepted the offer, watched Hutton's practice, and studied the manipulations of the bone-setter. On Hutton's death Dr. Wharton Hood published in THE LANCET a series of papers on Bone-Setting (So-called) which aroused great interest amongst the profession. Previous to 1871 Dr. Wharton Hood was in general practice with his father. On the issue of these papers various cases of injury were sent to him, and in consequence of a discussion on the question he began to attack the established practice of prolonged rest which was considered necessary in the treatment of the type of injuries which were coming under his care. Wharton Hood, in the late "seventies," adopted for recent injuries the treatment which is now common—that of massage and early movement in injuries to joints, and massage in fractures. Amongst some of the medical profession unjust views were held as to the ethical character of his methods. A friend of Wharton Hood, very intimately connected with him in his practice, has often stated that in the course of many years he never heard Wharton Hood criticise adversely the previous treatment in any case before him, even when attended by practitioners who held opposite views to himself, and some of the strictures applied to Hood must in these circumstances be described as outrageous. When Wharton Hood first took up the question of improving the treatment of stiff joints and allied conditions many practitioners might be said to have but a sketchy knowledge of the subject, and there is no doubt that when he retired from active practice he left his mark on surgery—some, indeed, would claim that he revolutionised the ordinary treatment in this class of case.

Hood amongst his intimate friends was known and appreciated because of his large and generous views of others' work, and his unfailing sympathy and kindness of heart. He was a fisherman and keen cricketer up to the time he was 50. He was a constant attendant at Lord's Cricket Ground, where many men of the staff have every reason to remember him. He was a remarkably good shot, and was generally interested in sport. He leaves one son and two married daughters.

Medical News.

UNIVERSITY OF CAMBRIDGE.—**At the examination** in Sanitary Science held recently the following candidates were successful in both parts of the examination:—

Satish Chandra Biswas, Kaikobad Temoolji Jungalwalla, Gulabrai Teckchand Makhijani, Gladys Montgomery, Charles Frederick Searle, and *Chik Hing Wan.

* Distinguished in Bacteriology.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the Final Examination, held from April 4th to 25th, the following candidates were successful in the subjects indicated below:—

Medicine.—**A. M. Ahmad, Guy's; E. B. Alabaster, Birmingham; R. Aspinall-Stivala, Guy's; K. D. Atteridge, St. Bartholomew's; A. J. Bado, St. Thomas's; H. S. Baker, St. Bartholomew's; H. W. Barnes, King's College; H. J. Bensted, Guy's; W. H. Blackburn; Cambridge and St. Bartholomew's; D. C. Bluett, Cambridge and St. Thomas's; E. G. P. Bousfield, St. Bartholomew's; D. S. Brachman, Pennsylvania and St. Bartholomew's; H. G. Broadbridge, London; I. R. R. Brogden, Cambridge and Guy's; W. W. K. Brown, St. Thomas's; L. J. F. Bull, St. Bartholomew's; G. E. Burton, Cambridge and St. Bartholomew's; H. H. Castle and L. A. Célestin, St. Thomas's; Hetty Ethelberta Claremont, Royal Free; A. H. Clarke, St. Thomas's; W. H. Coldwell, Westminster; M. C. Cooper, London; J. M. Courtney, St. Mary's; W. M. Crombie, St. Thomas's; L. Cunningham, Cambridge and St. Bartholomew's; R. C. Davenport, St. Bartholomew's; A. F. R. Dove, Durham; A. B. Dummere, London; S. G. Dunn, St. Bartholomew's; A. W. F. Edmonds, Westminster; J. S. Ellis, Cambridge and Guy's; P. O. Ellison, St. Bartholomew's; H. S. Evans, Cambridge and St. Thomas's; L. W. Evans, St. Bartholomew's; T. S. Evans, Cardiff and St. Mary's; W. Farquharson, St. Mary's; H. W. Featherstone, Cambridge and Birmingham; F. O. Fehrsen and G. Fehrsen, London; H. A. Fiddian, Cambridge and St. Bartholomew's; A. A. Fitch, Liverpool; M. R. V. Ford, Sheffield; F. C. A. Frith, Bristol; W. V. Gabe and W. B. Gabriel, Middlesex; G. T. Garraway, University College; L. S. Gathergood, Cambridge and Guy's; Iva Louise Glasier, Manchester; G. A. Goolden, Cambridge and St. Thomas's; G. C. Hartley, Birmingham; A. N. Haworth, Charing Cross; N. N. Haysom, St. Bartholomew's; Mary Isabella Hounsfield, Royal Free; E. G. Howell, Cardiff and St. Thomas's; G. P. B. Huddy, London; Edith Caroline Hudgell, Royal Free; J. B. Hume, St. Bartholomew's; G. K. E. Inman, Sheffield; B. B. Jareja, Cambridge and St. Thomas's; Elizabeth Ethel Jenkins, Sheffield and Royal Free; J. R. John, Cardiff and Charing Cross; W. G. Johnston, St. Mary's; G. E. Kidman, Guy's; P. R. E. Kirby, University College; D. L. Lees, Bristol; N. M. Lewis and E. E. Lightwood, Westminster; Annie Lloyd, Royal Free; W. Marriott, St. Thomas's; F. C. Mason, Middlesex; F. Mohamed, Cairo and Westminster; H. W. L. Molesworth, London; E. C. de M. Morgan, Guy's; G. Moulson, St. Thomas's; F. Newey, Birmingham; F. P. Nicholas, Cambridge and St. George's; D. C. Norris, London; F. C. Ormerod, Manchester; Margaret Stuart Palmer, Royal Free; G. E. Paul, Madras and Middlesex; J. A. P. Perera, Ceylon and London; R. B. Price, Birmingham; J. S. Ranson, Westminster; R. Rau-Damodar, Madras and Middlesex; Eveleen Blanche Gibson Rivington, Royal Free; C. Y. Roberts, St. Thomas's; Violet Ione Russell, Royal Free; B. Sahai, Calcutta and Charing Cross; M. Schwartz, University College; J. A. D. Skinner, Cambridge and St. Thomas's; A. C. Smith, Birmingham; D. M. Smith, Bristol; J. F. Smith, St. Thomas's; R. J. Staley, Birmingham; D. Standing, Leeds and Birmingham; B. P. Stookey, Harvard; G. C. Swanson, Glasgow; D. G. C. Tasker, Bristol; J. P. R. Tennekoon, Ceylon and London; I. Tewfik, Cairo and Guy's; H. M. Wharry, Oxford and St. Bartholomew's; J. de S. Wijeyeratne, University College; G. B. Wild, Manchester; A. Williams-Walker, Birmingham; A. G. P. Wills, Cambridge and St. Thomas's; C. E. Wise, Lausanne and University College; R. A. Woodhouse, Cambridge and St. Mary's; and R. S. Woods, Cambridge and St. George's.**

Surgery.—**W. Agar, Birmingham; G. C. Agarwala, London; E. B. Alabaster, Birmingham; Hannah Katherine Alton, Royal Free; D. H. Anthony, St. Mary's; R. Aspinall-stivala, Guy's; K. Atkin, Cambridge and Manchester; I. Aubrey, University College; J. Aydon, Cambridge and St. Bartholomew's; H. J. Bensted, Guy's; D. S. Brachman, Pennsylvania and St. Bartholomew's; J. P. Bracken, University College; I. R. R. Brogden, Cambridge and Guy's; C. P. L. Carrier, Charing Cross; A. S. Carter, Middlesex; H. H. Castle and L. A. Célestin, St. Thomas's; P. D. H. Chapman, Cambridge and Guy's; G. E. Chissell, Middlesex; Hester Mary Church and Mabel Campbell Clark, Royal Free; A. H. Clarke, St. Thomas's; P. S. Clarke, St. Bartholomew's; H. M. Cohen, Baltimore and St. Bartholomew's; W. H. Coldwell, Westminster; W. M. Crombie, St. Thomas's; Stephanie Patricia L. H. T. Daniel, Royal Free; R. C. Davenport, St. Bartholomew's; M. J. de Lemos, Bombay and King's College; F. P. G. de Smidt, London; A. F. R. Dove, Durham; S. G. Dunn, St. Bartholomew's; F. Dunphy, Westminster; M. Dwyer, Leeds and St. Thomas's; J. D. Dyson, Middlesex; W. F. Eberli, Cambridge and St. Bartholomew's; A. W. F. Edmonds, Westminster; D. D. Evans, Cambridge and St. Bartholomew's; G. I. Evans, Oxford and St. George's; H. S. Evans, Cambridge and St. Thomas's; H. W. Featherstone, Cambridge and Birmingham; S. W. Fisk, Middlesex; J. B. Flamer-Caldera, Ceylon and St. Bartholomew's; J. Fox-Russell, Middlesex; P. E. F. Frossard, London; A. R. Fuller, St. Mary's; D. H. A. Galbraith, Guy's; G. T. Garraway, University College; P. M. J. Van Gehuchten, Louvain and London; S. C. Ghose, Calcutta and St. Mary's; C. C. Goodall and F. H. S. Greenish, Cambridge and London; Ethne Haigh, Durham; J. C. N. Harris, Cambridge and St. Thomas's; S. F. Harris, London; J. M. Harrison, St. Thomas's; N. H. Harrison, Charing Cross; A. G. Harsant, London; N. N. Haysom, St. Bartholomew's; C. G. Hitchcock, London; C. E. Hopwood, Manchester; W. A. Hotson, Westminster; Mary Isabella Hounsfield, Royal Free; E. G. Howell, Cardiff and St. Thomas's; Edith Caroline Hudgell, Royal Free; S. Hutchinson, University College; T. H. Jackson, Charing Cross; B. E. Jerwood, Cambridge and Guy's; A. M. Jones, Charing Cross; T. Jones, Cambridge and Manchester; T. Joekes, Leyden and St. Bartholomew's; R. D. Kamdin, Bombay and Charing Cross; V. Kameneff, Moscow and University College; T. L. Kan, St. Thomas's; T. R. F. Kerby, Birmingham; A. D. Loganadan, Madras and London; R. P. Langford-Jones, University College; E. E. D. Lau, Durham; E. E. Lightwood, Westminster; Katharine Lloyd, Royal Free; H. B. Logan, Bristol and University College; P. G. McEvedy, Guy's; S. S. Malkani, Bombay and University College; P. S. Marshall, University College; F. C. Mason, Middlesex; Adeline Mabel Matland, Royal Free; B. H. Mellon, National University, Ireland; A. A. Miller, Heidelberg; H. W. L. Molesworth, London; T. D. Morgan, Cambridge and London; A. Morford, St. Bartholomew's; A. G. Morris, Bristol; G. Moulson, St. Thomas's; J. J. Murphy and S. Muttiah, London; R. L. Newell, Manchester; F. Newey, Birmingham; D. C. Norris, London; J. D. Oliver, Dublin and Middlesex; A. J. Orenstein, Jefferson; F. C. Ormerod, Manchester; P. E. D. Pank, Cambridge and London; G. E. Paul, Madras and Middlesex; E. S. Phillips, Guy's; J. W. G. Phillips, St. Mary's; R. R. Powell, Cambridge and St. Bartholomew's; R. H. C. Pryn, Guy's; J. N. Puri, London; H. M. Quackenbos, University College; C. R. Reckitt, London; T. H. Rhys, Cardiff and Charing Cross; Eveleen Blanche Gibson Rivington, Royal Free; P. G. Russell, Middlesex; Violet Ione Russell and Enid Eleanora Sanger-Davies, Royal Free; M. Schwartz, University College; J. A. D. Skinner, Cambridge and St. Thomas's; R. J. Staley, Birmingham; D. F. Standing, Leeds and Birmingham; W. Steadman, University College; B. P. Stookey, Harvard; G. C. Swanson, Glasgow; D. G. C. Tasker and R. H. Tasker, Bristol; H. W. Taylor, London; Lily Dorothea Taylor, Royal Free; H. Taylor, Liverpool; R. O. Towend, London; W. J. Vance, Guy's; H. C. Viehoff, Liverpool; H. S. Wacher, Guy's; G. B. Wild, Manchester; R. W. Willenberg, Ceylon and Middlesex; G. C. Williams, Cambridge and Bristol; A. Williams-Walker, Birmingham; W. E. Wilson, St. Bartholomew's; and C. E. Wise, Lausanne and University College.**

Midwifery.—**K. A. Anklesaria, Bombay and London; C. W. Armstrong Oxford and London; I. Aubrey, Cardiff and University College; J. R. Banks, University College; G. A. Beyers, St. Bartholomew's; Margaret Eliza Bjorkegren, Royal Free; W. H. Blackburn, Cambridge and St. Bartholomew's; L. G. Blackmore, Middlesex; C. J. L. Blair, St. Bartholomew's; J. N. L. Blamey, St. Thomas's; N. Bonard, Geneva; D. S. Brachman, Pennsylvania and St. Bartholomew's; C. V. Braimbridge, Cambridge and St. Bartholomew's; J. F. C. Braine, Guy's; G. E Burton, Cambridge and St. Bartholomew's; C. P. L. Carrier, Charing Cross; P. D. H. Chapman, Cambridge and Guy's; Stella Churchill, Royal Free; W. J. Colborne, Charing Cross; P. N. Cook, St. Bartholomew's; W. T. Cooper, Charing Cross; J. M. Courtney, St. Mary's; W. Cramer, Edinburgh and University College; W. M. Crombie, St. Thomas's; W. S. Dawson, Oxford and St. Thomas's; G. Day, St. Bartholomew's; A. R. K. Dina, Bombay and Guy's; J. D. Dimock, Middlesex; W. C. C. Easton, Manchester; D. D. Evans, Cambridge and St. Bartholomew's; J. Fairbrother, Cambridge and London; A. A. Fitch, Liverpool; J. B. Flamer-Caldera, Ceylon and St. Bartholomew's; A. Girgis, London; E. O. Goldsmith, Cambridge and St. Bartholomew's; T. S. Greenaway, Westminster; J. R. Harris, Cambridge and St. Thomas's; J. F. Haynes, Oxford and St. Bartholomew's; N. S. Hewitt, Cambridge and London; E. B. Hickson, University College; Edith Caroline Hudgell, Royal Free; J. W. Hyatt, London; G. K. E. Inman, Sheffield; B. E. Jerwood, Cambridge and Guy's; D. B. S. Jones, Charing Cross; T. R. F. Kerby, Birmingham; G. E. Kidman, Guy's; R. T. Lewis, Cardiff and University College; Katharine Lloyd, Royal Free; K. A. I. Mackenzie, Oxford and St. Bartholomew's; K. Masson, Cambridge and St. Bartholomew's; T. E. Micklem, Oxford and Guy's; K. V. Muttukumaru, Madras and London; R. L. Newell, Manchester; F. Newey, Birmingham; A. J. Orenstein, Jefferson and London; E. S. Orme, Cambridge and St. Thomas's; F. C. Ormerod, Manchester; A. Orr-Ewing, Cambridge and St. Bartholomew's; A. Pastel, Paris and Charing Cross; W. D. Pearman, Birmingham and St. Mary's; M. Pearson, Guy's; V. J. E. C. del S. Perez y Marzan, University College; B. H. Pidcock, St. Bartholomew's; C. N. Ratcliffe, Liverpool; S. D. Rhind, St. George's; Eveleen Blanche Gibson Rivington, Royal Free; A. Rodd, University College; B. T. Rose, Birmingham; W. R. Rowlands, Liverpool; Violet Ione Russell, Enid Eleanora Sanger-Davies, and Elisabeth Henrietta Schwab, Royal Free; S. N. Scott, Charing Cross; F. N. Sidebotham, Cambridge and Guy's; H. H. Silley, University College; A. C. Smith, Birmingham; N. H. Smith, Cambridge and Liverpool; V. R. Smith, St. Mary's; N. A. Sprott, Oxford and St. Thomas's; H. G. Stormer, St. Thomas's; G. C. Swanson, Glasgow; G. B. Tarring, Oxford and Guy's; D. G. C. Tasker, Bristol; H. W. Taylor, London; I. Tewfik, Cairo and Guy's; O. S. Thompson, St. Thomas's; R. R. Traill, Cambridge and Guy's; M. B. M. Tweed, Guy's; R. C. P. Whitcombe, Cambridge and St. Thomas's; G. B. Wild, Manchester; G. C. Williams, Cambridge and Bristol; J. P. Williams, Cardiff and Westminster; T. P. Williams, Middlesex; A. Williams-Walker, Birmingham; C. E. Wise, Lausanne and University College; R. A. Woodhouse, Cambridge and St. Mary's; K. M. C. Woodruff, Guy's; and W. Yeoman, University College.**

THE ONTARIO MEDICAL ASSOCIATION.—The thirty-sixth annual meeting of the Ontario Medical Association, of which Dr. H. B. Anderson is President, will be held at Toronto from May 31st to June 3rd. The meeting should be a notable one, as great efforts are being made to organise the profession in order that a firm position may be taken in regard to the many questions of professional and public interest which will come up for discussion, among them being the Workmen's Compensation Bill and the various matters which are being considered by the Commission on Medical Education. The address in Medicine will be

delivered by Dr. E. P. Joslin, of Boston, on the "Treatment of Diabetes"; the address in Surgery by Dr. de Wit Lewis, of Chicago; and the address in Gynæcology by Dr. J. F. Percy, of Salisbury, Ill. Arrangements have been made for a symposium on "The Rôle of the Nose, Mouth, Throat and Accessory Sinuses in relation to Systemic Disease." Dr. W. A. Price, D.D.S., Cleveland, will deal with mouth infections, illustrated by a kinematographic demonstration. "The Arthritides" will be taken by Dr. Joel Goldthwait, of Boston, and the "Nose, Throat, and Accessory Sinuses" by Dr. D. J. Gibb Wishart, Toronto; Professor Blackader, of Montreal, will deal with "Drugs and Medicinal Agents considered from the Professional, National, and Economic Standpoint"; Dr. Justus Matthews, of the Mayo Clinic, will give a paper on "Tonsillectomy with its General Results"; and Dr. Solomon Solis Cohen, of Philadelphia, will discuss the "Treatment of Pneumonia." An interesting feature of the meeting will be the discussions on "The Returned Solder's Problem from the Medical, Military, Vocational, and Economic Points of View." Professor Stephen Leacock, of McGill University, will address the meeting, and it is expected that there will be representatives of the various military convalescent hospitals throughout the dominion. An invitation has been extended to the Canadian Medical Association to hold its executive session in conjunction with the annual meeting, and it is hoped in this way to have a larger representation from the sister province than has been the custom in recent years. The medical officers of health will hold their annual convention on May 29th and 30th. Dr. F. Arnold Clarkson, 421, Bloor-street W., Toronto, is the secretary of the Ontario Medical Association meeting.

MEDICAL SOCIETY OF LONDON.—**The annual** general meeting of this society will be held on Monday, May 15th, at 8 P.M., at 11, Chandos-street, Cavendish-square, W., to receive the reports of (1) Council; (2) honorary librarian; (3) chairman of House and Finance Committee, and to elect officers and council for next session.

THE LATE MR. JOSEPH WILLIAM SMITH.—Mr. J. W. Smith, who was surgeon to the Northwich Infirmary and Weaverham Provident Dispensary, died recently at his residence at Weaverham, Cheshire, in his seventy-third year. He was the son of the late Dr. Samuel Smith, whom he succeeded in practice, and received his medical education at King's College, London, qualifying in 1866 with the M.R.C.S. and L.M. and the L.S.A. He was greatly respected and had a large practice, while he found time to do much excellent public work. He was a member of the Cheshire county council from 1889 to 1913 and had been a county magistrate since 1895.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Certifying Factory Surgeons.

ONE of the recommendations of the Retrenchment Committee was to save £12,500 a year to the Exchequer by the abolition of the reports of certifying factory surgeons. A deputation representing medical men interested in the matter has asked the Home Secretary to reconsider the step thus suggested, but Mr. HERBERT SAMUEL intimated that he was prepared to give effect to the recommendation of the committee.

Daylight Saving.

By 170 votes to 2 the House of Commons on Monday, May 8th, agreed to a resolution in favour of the advancement of the hands of the clock by an hour during the summer months so as to induce the community to take greater advantage of the early hours of daylight. On Tuesday the Home Secretary introduced a Bill, called the Summer Time Bill, to give legislative effect to this proposal.

The Military Service Bill.

The House of Commons began the Committee stage of the Military Service Bill on Tuesday, May 9th. Long discussions took place on Clause 1., which applies compulsory military service to all male British subjects between the ages of 18 and 41 resident in Great Britain. The question was raised of the application of this provision to a certain number of medical students. Mr. LONG, who was in charge of the Bill, said that their cases must be considered by the tribunals, as he did not think that it would be possible to make any special provision for them.

HOUSE OF COMMONS.

WEDNESDAY, MAY 3RD.

Chemists in the Army.

Mr. TYSON WILSON asked the Under Secretary for War whether there was a number of qualified chemists in the army whose services were not being used to the best advantage, and whether in view of the demand for dispensers he would take steps in the interests of the army to utilise the skill and knowledge of these men.—Mr. TENNANT answered: All medical units at home and abroad are fully supplied with dispensers. If any qualified chemists who are serving in combatant units make application to be transferred to the Royal Army Medical Corps, the case of each applicant will be considered as vacancies for employment arise.

Re-examination of Rejected Recruits.

Mr. ASQUITH, in the course of his speech introducing the Military Service Bill, said that it provided the power to enable the Army Council to review the medical certificates of those who had been rejected for military service on medical grounds since August 14th, 1915. The reason was a very simple one. As the standard of medical fitness had now been extended, and he thought very properly extended, and the men who were not fitted for active service abroad were now taken for less arduous duties, it was desirable in those cases that there should be at any rate an opportunity to review them. He believed that a great many of the men would be very glad that they should be so reviewed.

THURSDAY, MAY 4TH.

Dental Treatment of Troops in India.

Captain C. BATHURST asked the Secretary for India whether, seeing that the men of the 4th Battalion Wiltshire Regiment and other British troops in India suffered considerably from dental caries and other dental defects, which materially affected their health, the same provision could be made for their dental treatment at the public expense, either by the Indian Government or by the War Office, that was made in the case of other British troops serving overseas.—Mr. CHAMBERLAIN replied: On receiving the letter in which my honourable friend called my attention to the case of the Wiltshire Regiment, I telegraphed to the Government of India. I am also communicating with the War Office on the subject.

Soldiers and Smokers' Heart.

Mr. J. M. HENDERSON asked the Under Secretary for War whether he was aware that there were a very large number of men of the Expeditionary Force in hospital with what was called trench heart, but which was really the result of excessive cigarette and tobacco smoking; and, seeing that the number of cases was increasing, would he have the matter looked into with a view to remedying the evil.—Mr. TENNANT said in reply: A certain number of cases of disordered action of the heart are occurring—the so-called soldiers' heart. This is being investigated in a hospital specially set aside for the purpose. We have no evidence that the number of cases is increasing at present. By some observers this condition is attributed to excessive cigarette and tobacco smoking, and this is being looked into by skilled experts.

Medical Examination of Second-line Units.

Mr. ASHLEY asked the Under Secretary for War whether all men at the time when they joined second-line Territorial units were medically examined to ascertain if they were fit for military service.—Mr. TENNANT answered: All men are medically examined on enlistment and also as soon as possible after joining their units.

Mr. ASHLEY: Is the right honourable gentleman aware that in a considerable number of these second-line units there is a number of men perfectly unfit and of no earthly use for military service? It is a matter of common knowledge. Will the right honourable gentleman have another medical examination made in order to save the country enormous expense?—Mr. TENNANT: Yes, certainly, if my honourable friend will give me particulars of cases.

Sir C. KINLOCH-COOKE: There are thousands of such cases.

Major HAMILTON: Is the right honourable gentleman aware that an order was recently issued that medical officers attached to these units are not to examine men when they join?—Mr. TENNANT: I think my honourable and gallant friend is mistaken. No such order has been issued.

Major HAMILTON: I have seen it in print.

MONDAY, MAY 8TH.

Medical Reports on German Prison Camps.

Mr. J. M. HENDERSON asked the Under Secretary for Foreign Affairs whether he would include in the forthcoming White Paper on British Prisoner Camps in Germany the reports made by officers of the Royal Army Medical Corps who had returned from these camps.—Lord ROBERT CECIL replied: The White Papers hitherto laid before Parliament have included correspondence with the United States Ambassador and reports received through His Excellency only. The reports made by officers of the Royal Army Medical Corps referred to by the honourable Member have no relation to the period covered by the reports which will be included

in the forthcoming White Paper, but relate to a condition of things at a previous date, nor could they now be included without very much delaying the issue of this paper. A considerable portion of Major Priestley's report was embodied in the recently published report of the Government Committee on the treatment by the enemy of prisoners of war on the conditions obtaining at Wittenberg during the typhus epidemic. The question, however, of the separate publication of the reports made by officers of the R.A.M.C. who have returned from Germany will be considered.

Mr. HENDERSON: Surely the reports from men who have actually lived in the camps must be much more reliable and important than a report of a casual visitor.—Lord ROBERT CECIL: I quite agree, and the Government Committee was set up on purpose to consider all such reports and to get a true account of the condition of the prisoners drawn from those reports.

Medically Unfit Soldiers.

Major HAMILTON asked the Under Secretary for War whether he would consider the possibility of posting men who were medically unfit after return from the front to the Army Reserve, or of demobilising them in the case of Territorial units, so that they could return to their home comforts for a few months while receiving massage or other medical attention by attending daily the nearest military hospital.—Mr. TENNANT wrote in reply: From a medical point of view the proposal is not advisable. The men described are much more likely to get fit to return to duty if, on discharge from hospital, they are treated in command depôts where they have the advantage of medical treatment and graduated exercises under proper control.

TUESDAY, MAY 9TH.

Medical Examination of Recruits.

Mr. ASHLEY asked the Under Secretary for War whether he was aware that till recently Southern Command orders included an order to medical officers of units that they should at once medically examine all men joining to ascertain whether they were fit for general military service; that a short time ago an officer high in the medical service informed these officers that it was no business of theirs to inspect recruits, and that a fortnight ago an order was issued in this command that no medical inspection should take place except for infectious diseases; and whether he would at once give instructions that medical examination by the medical officers attached to units was to be resumed, so as to avoid waste of public money by inefficient soldiers being retained for a considerable time in the public service.—Mr. TENNANT answered: I am aware that there has been a change in the orders of the Southern Command in respect of this matter. Previous to the adoption of the system of examination of recruits by selected boards of R.A.M.C. officers, a large number were examined in the first instance by civil medical practitioners, and it was considered necessary that these men on joining their units should be re-examined by the regimental R.A.M.C. officer as the civil medical practitioners have not always the necessary experience in examining recruits. But now that all recruits are examined before enlistment by selected recruiting boards, the second examination by the regimental R.A.M.C. officer is not considered necessary except for the purpose of detecting infectious disease. As it is unnecessary, public money and public time is saved by its being abolished.

Medical Men in Ross-shire and Petrol Supplies.

Mr. MACPHERSON asked the Parliamentary Secretary to the Board of Trade whether he was aware that there was no petrol available in Ross and Cromarty for the use of merchants, surveyors, and doctors who had to use cars on account of the long distances and the lack of convenient railway facilities; and whether he would take the necessary steps to remedy this hardship.—Mr. PRETYMAN said in reply: I am afraid that in present circumstances there are bound to be difficulties in certain cases in securing adequate supplies of petrol. I believe that I have received a complaint from the district mentioned, and it is being dealt with by the Committee which the Board of Trade has recently appointed to take steps for the control of the supply and distribution of petrol.

WEDNESDAY, MAY 10TH.

Medical Men and Motor-car Taxation.

Mr. CATHCART WASON asked the Chancellor of the Exchequer whether he was aware that the increased taxation of motor-cars used by doctors pressed on the medical profession, and that the public interests suffered; and whether he would take into consideration the desirability of making a further concession, with especial consideration to the increased price of petrol and the difficulty of obtaining it.—Mr. MCKENNA replied: I am considering all questions relevant to the proposed increase of motor-car licence duty, but I must add that it would be difficult to justify any change which would give members of the medical profession—who only pay half duty—a greater proportional preference over other users of motor-cars.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

ASH, ALFRED EDWIN, M.D., Ch.B. Vict., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer of Health for Honiton (Devon).

BADO, A. J., M.R.C.S., L.R.C.P. Lond., Resident House Surgeon at St. Thomas's Hospital.

BLUETT, D. C., Casualty Officer at St. Thomas's Hospital.

BUATIA, S. L., M.R.C.S., L.R.C.P. Lond., Resident House Surgeon at St. Thomas's Hospital.

CAMPBELL, ANDREW, M.B., Ch.B. Edin., D.P.H., Resident Surgical Officer of the Birmingham and Midland Eye Hospital.

CASTLE, H. H., M.R.C.S., L.R.C.P. Lond., Ophthalmic House Surgeon at St. Thomas's Hospital.

CLARKE, A. H., M.R.C.S., L.R.C.P. Lond., Casualty Officer and Resident Anæsthetist at St. Thomas's Hospital.

CROMBIE, W. M., M.R.C.S., L.R.C.P. Lond., Obstetric House Physician at St. Thomas's Hospital.

GROSE, JOHN SOBEY, L.R.C.P. Lond., M.R.C.S., Medical Officer and Public Vaccinator for the Abbotsham, Buckland Brewer, and Bideford Districts, and Medical Officer to the Workhouse, by the Bideford (Devon) Board of Guardians.

HARRIS, J. C. N., M.R.C.S., L.R.C.P. Lond., Casualty Officer and Resident Anæsthetist at St. Thomas's Hospital.

HARRIS, J. R., Resident House Physician at St. Thomas's Hospital.

HAY, PERCIVAL J., M.D., Ch.B. Edin., Honorary Ophthalmic Surgeon to the Sheffield Royal Hospital.

HENSLEY, E. H. V., Resident House Physician at St. Thomas's Hospital.

HIGGINS, F. E., M.R.C.S., L.R.C.P. Lond., House Surgeon and Resident Anæsthetist at St. Thomas's Hospital.

HOWELL, E. G., M.R.C.S., L.R.C.P. Lond., Resident House Surgeon at St. Thomas's Hospital.

HUXLEY, FRANCES M., M.D. Vict., Assistant Surgeon to the South London Hospital for Women.

HYMAN, O. H., Resident House Surgeon at St. Thomas's Hospital.

MACKENZIE, LEWIS, F.R.C.S. Eng., L.R.C.P. Lond., Acting Tuberculosis Medical Officer for the Borough of Barnstaple (Devon).

MAVROGARDATO, A., M.R.C.S., L.R.C.P. Lond., Resident House Physician at St. Thomas's Hospital.

MOULSON, G., M.R.C.S., L.R.C.P. Lond., Casualty Officer and Resident Anæsthetist at St. Thomas's Hospital.

NAIRNE, N. S., Casualty Officer at St. Thomas's Hospital.

NUTT, W. HARWOOD, M.D., Ch.B. Edin., reappointed Honorary Medical Officer in the Electrical Department of the Sheffield Royal Hospital.

PEARSON, ELLIS, F.R.C.S. Edin., L.R.C.P. Edin., appointed Medical Officer for the Milton District by the Barnstaple (Devon) Board of Guardians.

SIMPSON, GRAHAM, F.R.C.S. Eng., reappointed Honorary Surgeon to the Sheffield Royal Hospital.

STORMER, H. G., M.R.C.S., L.R.C.P. Lond., appointed Casualty Officer and Resident Anæsthetist at St. Thomas's Hospital.

UMANSKI, AUGUSTA, M.B., B.Ch. Leeds, Assistant Medical Officer to the Infectious Diseases Hospital, Seacroft, Yorks.

VEY, F. H., Resident House Physician at St. Thomas's Hospital.

WILKINSON, GEORGE, M.B., B.C. Cantab., F.R.C.S. Eng., reappointed Honorary Aural Surgeon to the Sheffield Royal Hospital.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BARNSLEY, BECKETT HOSPITAL AND DISPENSARY.—House Surgeon. Salary £250 per annum, with apartments, &c.

BELFAST MUNICIPAL SANATORIUM.—Temporary Assistant Resident Medical Officer. Salary £200 per annum, with board, &c.

BIRKENHEAD BOROUGH HOSPITAL.—Junior House Surgeon. Salary £170 per annum, with board, &c.

BIRMINGHAM GENERAL DISPENSARY.—Resident Medical Officer, unmarried. Salary £250 per annum, with apartments, &c.

BOLTON INFIRMARY AND DISPENSARY.—Female Second House Surgeon. Salary £200 per annum, with apartments, &c.

BOLTON UNION.—Resident Assistant Medical Officer for Townleys Hospitals, Farnworth, near Bolton. Salary £250 per annum, with apartments, &c.

BRISTOL ROYAL INFIRMARY.—House Physicians and House Surgeons. Salary at rate of £120 per annum, with board, &c.

BURNLEY, VICTORIA HOSPITAL.—Female House Surgeon. Salary £160 per annum, with residence, &c.

BURY INFIRMARY.—Female Senior House Surgeon and Female Junior House Surgeon. Salary £250 and £150 per annum respectively, with board, &c.

CAMBRIDGESHIRE ASYLUM, Fulbourn, near Cambridge.—Junior Assistant Medical Officer, unmarried. Salary £200 per annum, with board, &c.

CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST, Victoria Park, E.—Assistant Resident Medical Officer. Salary at rate of £150 per annum, with board, &c.

DERBY COUNTY ASYLUM, Mickleover, Derby.—Locum Tenens. Salary £6 6s. per week, with board, &c.

DEWSBURY COUNTY BOROUGH.—Female Medical Practitioner. Salary £300 per annum, and out-of-pocket expenses.

DUDLEY, GUEST HOSPITAL.—Assistant House Surgeon for six months. Salary at rate of £120 per annum, with board, &c.

GALWAY HOSPITAL.—Resident Medical Officer and Compounder of Medicine. Salary £100 per annum, with apartments, &c.

HASTINGS, EAST SUSSEX HOSPITAL.—House Surgeon. Salary £100 per annum, with residence, &c.

HYDE, BOROUGH OF.—Medical Officer of Infant Clinic and School Medical Officer. Salary at rate of £350 per annum.

KENT EDUCATION COMMITTEE.—Temporary School Medical Inspector and Medical Officer of School Clinic. Salary at rate of £350 per annum, with travelling and sustenance allowances.

KING EDWARD VII.'S HOSPITAL FOR OFFICERS, 9, Grosvenor-gardens, S.W.—Resident Medical Officer.

LEEDS PUBLIC DISPENSARY.—Two Resident Medical Officers. Salary £200 per annum, with board, &c.

LEWISHAM, BOROUGH OF.—Tuberculosis Dispensary Medical Officer. Salary at rate of £250 per annum.

LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W.—Non-resident Assistant House Surgeon for six months. Salary at rate of 120 guineas per annum.

MANCHESTER CHILDREN'S HOSPITAL, Pendlebury.—Two Female Resident Medical Officers, unmarried, for six months. Salary at rate of £100 per annum.

MANCHESTER, CITY OF.—Female Medical Officer, to hold Consultations and Infant Clinics at Maternity and Child Welfare Centres, &c. Salary £350 per annum.

MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Parkplace, Cheetham Hill-road.—Female House Surgeon. Salary £120 per annum, with apartments, &c.

MANCHESTER, ST. MARY'S HOSPITALS FOR WOMEN AND CHILDREN.—Resident Surgical Officer at High-street Hospital. Salary at rate of £150 per annum, with board, &c.

NEW HOSPITAL FOR WOMEN, Euston-road, N.W.—Female Senior Clinical Assistant to Out-patients. Also Two House Surgeons, House Physician, and Obstetric Assistant (all females), for six months, with board, &c.

NOTTINGHAM GENERAL HOSPITAL.—Assistant House Surgeon. Salary at rate of £250 per annum, with board, &c.

PADDINGTON GREEN CHILDREN'S HOSPITAL, London, W.—Female House Surgeon for six months. Salary at rate of £80 per annum, with board, &c.

ROCHESTER, ST. BARTHOLOMEW'S HOSPITAL, Kent.—Clinical Assistant. Salary at rate of £110 per annum, with board, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—Examiners and Professors and Lecturers.

SALISBURY GENERAL INFIRMARY.—House Surgeon and Assistant House Surgeon, unmarried. Salary £150 and £100 per annum respectively, with apartments, &c.

SHEFFIELD, JESSOP HOSPITAL FOR WOMEN.—Female Junior House Surgeon, unmarried. Salary £80 per annum, with board, &c.

SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.

SHEFFIELD UNION HOSPITAL, Fir Vale, Sheffield.—Resident Assistant Medical Officer. Salary £400 per annum, with apartments, &c.

VENTNOR, ISLE OF WIGHT, ROYAL NATIONAL HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST.—Assistant Resident Medical Officer.

VICTORIA HOSPITAL FOR CHILDREN, Tite-street, Chelsea, S.W.—House Physician. Salary £200 per annum, with board, &c.

WEST END HOSPITAL FOR DISEASES OF THE NERVOUS SYSTEM, 73, Welbeck-street, W.—Clinical Assistants to Out-patients' Physicians.

WIGAN, ROYAL ALBERT EDWARD INFIRMARY AND DISPENSARY.—Senior House Surgeon. Salary £250 per annum, with board, &c.

Births, Marriages, and Deaths.

BIRTHS.

BARENDT.—On May 3rd, at 65, Rodney-street, Liverpool, W., the wife of Frank Hugh Barendt, M.D. Lond., F.R.C.S. Eng., of a daughter.

CRAGG.—On May 1st, at Wymering, Hampshire, to Florence Everilda, wife of Cecil Claude Cragg, M.D., Lieutenant, R.A.M.C., a son.

DOTTRIDGE.—On April 4th, at Portland Court, W., the wife of Cecil A. Dottridge, M.B. Lond., of a daughter.

STEPHENS.—On May 5th, at St. Giles, Malvern Link, Worcestershire, the wife of H. N. Stephens, late Staff Surgeon, Royal Navy, of a son.

MARRIAGES.

FEHRSEN—NICHOLSON.—On May 1st, at St. Augustine's, Kilburn, Guy Fehrsen, Lieutenant, R.A.M.C., to Dorothea Edith Warren, elder daughter of the Rev. J. B. Nicholson, C.F., and Mrs. Nicholson, of Swindon.

MCLAY—BARTLETT.—On May 6th, at Holy Trinity Church, Folkestone, Samuel McMurrich McLay, Captain, R.A.M.C., to Florrie, only daughter of Mr. and Mrs. W. J. Bartlett, of Woodstock, Ontario, Canada.

PASLEY—ELLIOTT.—On May 8th, at St. Mary's, West Kensington, Claud John Burgoyne Pasley, M.R.C.S., West African Medical Staff, to Blossom Emily, youngest daughter of the late Major William Elliott, Royal Artillery.

THATCHER—ANNANDALE.—On April 27th, at the Episcopal Church of St. Leonard's, Lasswade, Midlothian, Lewis Hay F. Thatcher, M.D., F.R.C.P. Edin., Captain, R.A.M.C., to Sibyl Muriel, third daughter of James H. Annandale, of The Vale, Polton, Midlothian.

DEATHS.

CHESTER.—On May 5th, at Coney Gree, Upper Hatherley, Cheltenham, Colonel William Litchfield Chester (late R.A.M.C.), aged 65 years.

DONALD.—On May 3rd, at Oakley-street, Chelsea, Robert Donald, L.R.C.P. Edin., Captain, R.A.M.C. (T.F.), aged 55 years.

GODDARD.—On May 2nd, at Montalt-road, Woodford, Essex, Bertram Goddard, M.R.C.S., L.R.C.P. Lond., in his 49th year.

MANSFIELD.—On May 7th, at Royal Naval Hospital, Haslar, Gosport, Deputy Surgeon-General C. J. Mansfield, R.N., M.V.O., in his 55th year.

WAKLEY.—On May 3rd, at Laburnum Cottage, Chertsey, Harriette Anne, widow of Thomas Henry Wakley, F.R.C.S. Eng.

N.B.—A fee of 5s. is charged for the Insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

SHOCK AND THE SOLDIER.

To the Editor of THE LANCET.

SIR,—Many besides myself must have read with pleasure Professor G. Elliot Smith's papers in THE LANCET under the above heading. Talk of "cowardice," "slacking," "malingering," and the like, comes so readily from the superior but somewhat pedantic people, who so largely control our politics, and, I am afraid, are not altogether unknown in the domain of medical psychology, that it is almost a surprise to come upon articles written with such engaging freshness, with so kindly and comprehensive an appreciation of the real inwardness of the problems which Professor Smith discusses.

Particularly valuable is the insight which we here obtain into the kind of temperament and character which furnishes the greater number of the victims of shock. No one who has even a small first-hand knowledge of the facts will suppose that these people are any less courageous than others. Many of them have given evidence of an effusive patriotism, of a willingness to risk careers and life itself in the present crisis, which makes the ineffectiveness of their sacrifice not a little disappointing and even tragic. What rendered their efforts unavailing was the disastrous reaction on their too sensitive nerves of the high strains, actual or anticipated, of the battle-field.

In searching for remedies there is really no need to discuss, as some authorities are disposed to do, whether the phenomena are more psychical or more physical. In their ultimate analysis the two things do not perhaps admit of absolute differentiation. What is alone of importance is the pathological condition, with this double mental and material aspect, with which, as physicians, we have to deal. We are face to face with the fact that there is a class of persons who, by constitution and by their previous life experience, are unfit for military service, and who yet, by enlistment or otherwise, are now in the army in considerable numbers. They are, in the main, gentle, often mentally brilliant creatures, for whom the rough and tumble of life, whether in war or peace, are a too ungenial setting. In war they go under in the way we see. In peace they are fated to succumb in the struggle with less sensitive, stronger-nerved competitors, but in favourable circumstances may develop gifts which are ultimately of far greater importance to the world than the war aptitude of the more stably-organised. Unless work can be found for them for which they are qualified by previous training and experience the only thing to be done is to discharge them from the army, whatever expense the necessary pensioning of them until they have recovered from the injury sustained in the war may entail. We may perhaps hope that the knowledge we are now gaining will enable the neurologist of the future by study of the life-history and heredity of applicants for military service to reject a large proportion of those who are liable to suffer from shock.

A thing which has greatly surprised me is the naming of the symptoms in so many of the descriptions that are given of them "hysteria." "Neurasthenia," "melancholia," even "hypochondria" I can understand, but "hysteria" seems to me in nearly all cases dubious, and, in far the majority, wholly inappropriate. Apart from soldiers returned from service, I have notes of some 60 patients who suffered from Zeppelin scare during last summer's raids. Among the men thus affected there was not a single instance which could with the utmost latitude of language, or at least by any stretch of the language which I am accustomed to use in describing symptoms, be appropriately spoken of as "hysterical." In the case of two women, who, on hearing the explosions, became at once unconscious and remained so for a considerable time, the name might apply; but in the large majority, even of my female cases, the symptoms had no relation to what is ordinarily understood by hysteria. Neurasthenia, verging towards melancholia and often involving complete and prolonged inability to concentrate upon work, was the main feature of the trouble in men. Among women the chief complaint was of dyspepsia and insomnia. How far the nervous system is permanently damaged or has its reactions thrown out of order only temporarily will not be known till we have more complete records or till peace is declared. In many cases, more especially in men, it is impossible to feel any assurance that the disease will ever be entirely cured. One patient, a woman, has become definitely insane. I think it will be found in the end that many temperamental instabilities, which but for the war would have remained latent, or at least unobserved, have become more or less permanently manifest.

I am, Sir, yours faithfully,

London, April 25th, 1916. I. B. MUIRHEAD.

HEALTH AND SANITATION IN NIGERIA.

A REPORT on the affairs of Nigeria for 1914 by Sir Frederick Lugard has recently been presented to Parliament, the delay in its production being due to the unusual importance of the events of the year under review, which witnessed the amalgamation of the two Administrations of Northern and Southern Nigeria into a single Government, and the outbreak of war in Europe with its consequential war in the Cameroons (adjoining Nigeria). The European population of the Colony and Protectorate is estimated at 3000, of whom about 1300 are officials. The native population is estimated at 17½ millions, the average density in the Northern Provinces being about 37 to the square mile, and in the Southern Provinces about 106. During the year there were 27 deaths amongst the European population, as compared with 13 in 1913, the increase being mainly due to war casualties on the Cameroon frontier. The number of European officials invalided was 61, as against 50 in 1913. Malaria is still the prevailing cause of ill-health among Europeans. There were amongst Europeans 6 deaths due to blackwater fever and 4 to yellow fever. The most common diseases among the native population are pneumonia, constipation and diarrhœa, anæmia, neuralgia, and rheumatic affections. Pneumonia is one of the most serious acute diseases from which the native suffers; it is most common during the cold harmattan season. There was a large increase in the number of cases of beri-beri reported, almost entirely in the Cross River districts; 227 cases occurred with 5 deaths, none of these being Europeans. Dysentery showed an increase, and there was an epidemic of it in the Udi prison, where there were 9 deaths. Emetine has been largely used in treatment, with good results. Nearly 90 per cent. of the cases of leprosy in the Southern Provinces occur on the River Niger in the neighbourhood of Onitsha, while the Eastern Provinces appear to be almost free from the disease. A modified system of segregation and isolation, by the establishment of leper settlements or "villages" maintained by the native community, principally in the neighbourhood of the larger towns, has been introduced. A severe epidemic of small-pox occurred in the Ekiti country in the Southern Provinces. This district is believed to be the last stronghold of what remains of the now almost extinct Shopono, or small-pox worship, which was once the scourge of Yorubaland. Action is now being taken by the Government to stamp out what remains of this pernicious juju in the Ekiti country. A systematic investigation of the prevalence of ankylostomiasis has been instituted with a view to determining, if possible, to what extent this disease and malaria are responsible for the anæmia so common to the country, and drawing conclusions as to the efficacy of treatment by thymol and other drugs. There is no doubt that the disease is very widespread; the average number infected works out at about 43 per cent., but Europeans are practically exempt.

Sanitary progress has been well maintained. The water-supply of Kano, which had been a source of anxiety for some time, was thoroughly investigated by the sanitary officer, who, *inter alia*, succeeded in isolating a hitherto unknown bacillus closely allied to the typhoid group. Drastic steps were taken, and the end of the year found the water-supply as much improved as it is ever likely to be until the installation of the proposed new supply from the River Shalawa. Two European officers were invalided from the Benue with trypanosomiasis, while 5 natives were admitted to hospital with the same infection, one of whom died from sleeping sickness. The sanitary officer proceeded up the Benue to investigate the extent of the disease and to devise preventive measures. Special attention has been given to steps directed against the possible introduction of plague from the Gold Coast and propagation and spread of yellow fever. A beginning was made with the systematic training of intelligent young natives as sanitary inspectors, and the teaching of hygiene in schools and by practical demonstrations is being continued.

A REQUEST FOR INFORMATION.

To the Editor of THE LANCET.

SIR,—"Family Histories" should have little difficulty in solving his three queries.

1. *New Sydenham Society.*—You have already supplied him with information upon this point.

2. *Dr. Sanders, of York (1817–1823).*—No medical directory was published at that time. As, however, Dr. Sanders was Lord Mayor of York, the town clerk of that city would supply your correspondent with Dr. Sanders's Christian name and details of his civic career. Possessed of his Christian name, Foster's "Alumni Oxoniensis," Greene's "Athenæ Cantabrigienses" and graduate lists of other Universities (generally found in large public libraries) should be consulted as to Dr. Sanders's parentage and academic achievements.

3. *Dr. Robert Pope,* "dear old Pope," as he was affectionately called by the children of the Royal Family, resided at Staines, from which he was frequently summoned to Windsor Castle by Queen Charlotte to attend the Princess Amelia, then dying of consumption. He was a Quaker, and his memoir will be found in the "Biographical Catalogue of the Society of Friends," 1888. Under the heading "Medical Adventures on Hounslow Heath," I published a short account of Dr. Pope in the *West London Medical Journal*, January, 1912. He is also frequently referred to in Pemberton's "Romance of the Princess Amelia."

I am, Sir, yours faithfully,

S. D. CLIPPINGDALE, M.D.

Holland Park-avenue, W., May 6th, 1916.

SOUTH TRAVANCORE MEDICAL MISSION.

THIS branch of the London Missionary Society in its report for the year 1915, giving a record of excellent work, seeks financial help for the better equipment of the branch hospitals and dispensaries in the coming year, pointing out that £8 supports a nurse annually, £5 a cot, and £3 an orphan. A summary of the work of the mission shows that it deals with 11 hospitals and eight dispensaries—189 beds. There are 18 trained assistants and eight medical students. The new patients for the year were 115,482, and the surgical operations, including 642 major operations, 8480. There were 36 male and 7 female patients in the Leper Asylum, and 21 children in the Orphanage.

TO PIPE SMOKERS.

To the Editor of THE LANCET.

SIR,—I think it is generally admitted that pipe-smoking in the tropics does not possess the same charm which it has in colder climates. The smoke seems to burn the tongue too readily, and the use of the pipe is generally abandoned in favour of cigars and cigarettes, until a return to cooler climates makes the smoker search for seasoned friends in odd forgotten corners. This was my own experience for nearly 20 years until a few months ago I was introduced to the well-known calabash pipe. The result was a revelation, and pipe-smoking in the tropics became an abounding pleasure to me for the first time. It then struck me that perhaps the well-known sensation of "burning the tongue" might be really a temperature effect rather than an increase in ammonia content, acridity, or other chemical factors.

The following experiments were therefore undertaken; and the results, with their tentative conclusions, may perhaps be of interest to your readers:—

Data.—(*a*) A 5-inch bull-dog briar. Vulcanite mouthpiece. One month old. Bowl not much caked. (*b*) A small-sized calabash pipe. Removable inner bowl of meerschaum. Vulcanite mouthpiece. Two months old. Bowl fairly caked. (*c*) Each pipe artificially smoked to the very end, by the use of a rubber tube and a gas-pump, simulating normal conditions as closely as possible. (*d*) Bulb of a centigrade thermometer (certificated, non-registering) inserted in the rubber tube at ½ inch from the opening of the mouthpiece, and direct continuous observations taken. (*e*) The pipes allowed to get quite cool between each experiment. (*f*) Only well-known tobaccos used.

Table of Maximum Smoke Temperatures in Degrees Fahrenheit.

—	Air at 55° F. (i.e., mean temperate climate)	Air at 82·4° F. (i.e., mean tropical climate
BRIAR PIPE—		
Tobacco A (fine-cut and very moist)	107·6	113·0
Tobacco B (fine-cut, dry)	105·8	111·2
,, C (coarse-cut, very dry)	98·6	100·4
CALABASH PIPE—	(N.B., Breath temperature, 91·4)	
Tobacco A	87·8	89·6
,, B	86·0	87·8
,, C	82·4	86·0

Conclusions.—1. Moist tobacco gives hotter smoke than dry tobacco. 2. Fine tobacco gives markedly hotter smoke than does coarse-cut tobacco. 3. Smoke from a briar is very considerably hotter in the tropics than in cold climates, especially with fine-cut tobaccos. 4. Smoke from a briar is *always* hotter than the breath temperature, although with a coarse tobacco on a cold winter's day the difference of temperature would be hardly noticeable. 5. Variations in air temperature or in the type of tobacco used have comparatively slight effect on the temperature of the calabash smoke—the latter being always cooler than the temperature of the breath. 6. According to the tobacco used, a calabash gives smoke which is 14 to 24 degrees cooler than a briar. 7. A coarse-cut tobacco, dry, and smoked in a calabash pipe would seem to be the acme of "cool" pipe-smoking.

I am, Sir, yours faithfully,

Singapore, March 28th, 1916. GILBERT E. BROOKE.

MATERNITY DEATH-RATE IN CORNWALL.

THE medical officer of health for Cornwall, in his annual report for 1915, alludes to the mortality from child-bearing in Cornwall, the death-rate being 4·5 per 1000 births compared with 4·0 for England and Wales. This mortality-rate depends principally on the quality of skilled assistance, before, during, and after the delivery of the mother, and the Cornwall County Nursing Association are trying to provide nurse-midwives in the rural districts, where at present none are resident.

C. D. S.—It is generally supposed that the Dr. Caius of Shakespeare was in no way meant to represent the learned physician and second founder of Gonville and Caius College, Cambridge.

O. W.—The academical costume of a Member of the Royal College of Surgeons of England is a black stuff gown with crimson satin facings. The gown of the F.R.C.S. is similar, but has more conspicuous facings and a modified sleeve. The usual mortar-board with black tassel is the regulation cap, but hoods are not provided, having been considered emblematic of university degrees.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, May 10th, 1916.

Date.		Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
May	4	29·700	S.W.	...	109	70	50	52	55	Cloudy
,,	5	29·386	E.	0·10	111	71	54	55	59	Cloudy
,,	6	29·446	S.W.	0·02	96	63	50	53	55	Cloudy
,,	7	29·550	S.W.	0·18	70	60	48	52	56	Cloudy
,,	8	29·693	S.W.	0·29	59	50	44	42	45	Cloudy
,,	9	29·706	S.	0·23	84	54	42	47	48	Raining
,,	10	29·984	N.W.	...	107	58	41	45	49	Fine

BOOKS, ETC., RECEIVED.

ALLEN, GEORGE, AND UNWIN, LIMITED, London.
European Anarchy. By G. Lowes Dickinson. Price 2*s.* 6*d.* net.

BADGER, RICHARD G., Boston. COPP CLARK COMPANY, Toronto.
Manual of Vital Function Testing Methods and Their Interpretation. By Wilfred M. Barton, M.D. Price $1.50.
Nervous Children. By Beverley R. Tucker, M.D. Price $1.25.

CAMBRIDGE UNIVERSITY PRESS, Cambridge.
Cerebro-Spinal Fever. By Michael Foster, M.A., M.D., Captain, R.A.M.C.; and J. F. Gaskell, M.A., M.D., Captain, R.A.M.C. Price 12*s.* 6*d.* net.

CASSELL AND CO., LIMITED, London.
The Other Side of the Lantern: An Account of a Commonplace Tour Round the World. By Sir Frederick Treves, Bart., G.C.V.O., C.B., LL.D. Price 2*s.* 6*d.*

CHATTO AND WINDUS, London.
The Night Cometh. By Paul Bourget. Translated by G. F. Lees. Price 6*s.*

CLARIDGE, G., AND CO., Caxton House, Bombay.
Indian Manual of First Aid. By Lieutenant-Colonel R. J. Blackham, C.I.E., R.A.M.C. Twelfth edition. Price R.1.

"ELLINGWOOD'S THERAPEUTIST," 32, North State-street, Chicago.
American Materia Medica, Therapeutics, and Pharmacognosy. By Finley Ellingwood, M.D. With Practical Consideration of the Principles of Pharmacy and Pharmacognosy. By Professor J. Uri Lloyd, Ph.M., Ph.D., LL.D.

HEINEMANN, WILLIAM, London.
Pathological Lying, Accusation, and Swindling: A Study in Forensic Psychology. By Wm. Healy, A.B., M.D., and Mary Tenney Healy, B.L. Price 10*s.* 6*d.* net.

LAURIE, T. WERNER, London.
The Great Unmarried. By Walter M. Gallichan. Price 7*s.* 6*d.*

LEWIS, H. K., AND CO., London.
A New Treatment for Gonorrhœa. By Charles Ruse, M.B. Lond., M.R.C.S. Eng., L.R.C.P. Lond. Price 3*s.* net.
Modern Medicine and Some Modern Remedies. By T. B. Scott. With Preface by Sir Lauder Brunton, Bart. Price 4*s.* 6*d.* net.
Diagnosis and Treatment of Heart Disease. By E. M. Brockbank, M.D., F.R.C.P. Second edition. Price 3*s.* 6*d.* net.
Notes on Galvanism and Faradism. By E. M. Magill, M.B., B.S., D.P.H.

MACMILLAN COMPANY, New York and London.
Medical and Veterinary Entomology. By W. B. Herms. Price 17*s.* net.
The New Public Health. By H. W. Hill, M.D., D.P.H. Price 5*s.* 6*d.* net.

WRIGHT, JOHN, AND SONS, Bristol.
Text-Book of Nervous Diseases. By Charles L. Dana, A.M., M.D., LL.D. Eighth edition. Price 21*s.* net.
Our Baby: for Mothers and Nurses. By Mrs. J. Langton Hewer. Fifteenth edition. Price 1*s.* 6*d.* net.

YALE UNIVERSITY PRESS, Newhaven, Conn., and New York City. OXFORD UNIVERSITY PRESS, and HUMPHREY MILFORD, London.
Changes in the Food Supply and their Relation to Nutrition. By Lafayette B. Mendel. Price 50 cents.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Tuesday, May 16th.

THERAPEUTICS AND PHARMACOLOGY (Hon. Secretaries—W. Langdon Brown, Philip Hamill, J. Gordon Sharp): at 4.30 P.M.
Annual General Meeting.—Election of Officers and Council for Session 1916-1917.
Discussion:
On the "Treatment of Diabetes by Alimentary Rest," will be opened by Dr. O. Leyton.
Dr. Spriggs, Mr. Joseph Barcroft, F.R.S., Dr. Ryffel, and Dr. Langdon Brown will take part.

PSYCHIATRY (Hon. Secretaries—Bernard Hart, G. F. Barham): at 6 P.M.
Annual General Meeting.—Election of Officers and Council for Session 1916-1917.

Thursday, May 18th.

DERMATOLOGY (Hon. Secretaries—A. M. H. Gray, J. E. R. McDonagh): at 5 P.M.
Annual General Meeting.—Election of Officers and Council for Session 1916-1917.
Exhibition of Cases (at 4.30 P.M.).
Cases:
Dr. George Pernet: (1) Tertiary Syphilis in a Woman treated by Intramine; (2) Urticaria Pigmentosa in an Infant.
Dr. Graham Little: (1) Parakeratosis Variegata; (2) Lichen Scrofulosorum with Scrofulodermia.

Friday, May 19th.

OTOLOGY (Hon. Secretaries—W. M. Mollison, E. D. D. Davis): at 5 P.M.
Annual General Meeting.—Election of Officers and Council for Session 1916-1917.
Cases and Specimens:
Will be shown by Mr. J. S. Fraser, Sir William Milligan, Mr. Sydney Scott, Mr. W. M. Mollison, and others.
Mr. W. M. Mollison: A Note on the Monochord.

ELECTRO-THERAPEUTICS (Hon. Secretaries—S. Gilbert Scott, H. P. Cumberbatch): at 8.30 P.M.
Annual General Meeting.—Election of Officers and Council for Session 1916-1917.
Exhibition of X Ray and Electro-Medical Apparatus. Radiographs, Lantern Slides, &c., will also be exhibited.
Members wishing to show Plates, &c., will kindly communicate as soon as possible with Mr. S. Gilbert Scott, 6, Bentinck-street, W.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY.—8 P.M., Annual General Meeting to receive the Reports of:—(1) Council, (2) Hon. Librarian, (3) Chairman, House and Finance Committee, and to Elect Officers and Council for next Session.

LONDON DERMATOLOGICAL SOCIETY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY.—4.30 P.M., Cases sent for Consultation. Demonstration of Pathological Specimens. Exhibition of Clinical Cases by Dr. J. L. Bunch, Dr. M. Dockrell, Captain W. Griffith, Dr. W. K. Sibley, and Dr. C. Kempster. 5 P.M., Paper:—The President (Dr. J. L. Bunch): Dermatitis due to Hair Dyes.

ROYAL MICROSCOPICAL SOCIETY, 20, Hanover-square, W.
WEDNESDAY.—Paper:—Mr. J. W. Purkiss: Some Suggestions regarding Visual Efficiency in the Use of the Microscope and Other Optical Instruments.

SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.
FRIDAY.—5.30 P.M., Paper:—Major J. M. Atkinson, R.A.M.C.: Cerebro-spinal Fever, with the Notes of Some Cases.—Dr. A. C. Stevenson will show some Specimens of Nodules in Lung from a Case of Morphia Injectors' Septicæmia (Whitmore's Disease), and Cultures of a Bacillus isolated from the same.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.
TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Addison: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations. Dr. Simson: Diseases of Women.
THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.
FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Addison: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. H. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham): Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).

WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks).

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. E. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

THE THROAT HOSPITAL, Golden-square, W.

MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.

THURSDAY.—5.15 P.M., Clinical Lecture.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

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